March 2, 1964

NOTES 3-2-64 BELEW

B3/5

RL10 ENGINE PROGRAM

We are meeting with Boeing and P&VE this week to discuss details of the Boeing proposed use of RL10 engines for a Boeing sponsored test program. Allocation of RL10 engines is being reviewed in detail to evaluate the most efficient utilization of engine hardware previously procured and on order. Lee You know that we committed ourselves to Lyle Wood !! Don't let me down! B

F-1 ENGINE PROGRAM

A joint F-1/J-2 detail facility requirements review was held at Rocketdyne the week of February 10 for the purpose of evaluating Rocketdyne's facility needs, particularly with respect to the fabrication areas. The review was conducted with some very fine detail support from ME Laboratory. Results so far have been that out of a total F-1/J-2 facility requirement of approximately $20 million, 50% of the items (on a cost basis) have either been rejected or deferred for further study. The remaining 50% of the items will be funded immediately. A final position is expected by this office on the deferred items within the next three or four months.

Engine F-1002 completed acceptance firing and is being moved to Canoga Park for post-acceptance inspection. This is the second R&D configuration engine intended for MSFC single engine testing. Concern has been registered by Q&RA Laboratory as to acceptability of the thrust chamber which developed five cracks under the thrust chamber jacket. These cracks have been repaired, and this office is currently coordinating the acceptability of this engine with MSFC. It is felt that the engine should be accepted for R&D testing here at MSFC, realizing that the life of this engine may be less than with engine F-1001.

The F-1 project manager will attend F-1 engine contract negotiations, at NASA Headquarters this week, as an advisor on problem areas.

On Friday night there was a LOX pump explosion on engine No. 014 on test stand 1B-2. Preliminary investigation indicates that the explosion occurred in the impeller area.

Test stand damage was limited to instrumentation and electrical wiring. It is estimated that test stand 1B-2 will be out of operation for 3 weeks and that the adjacent position 1B-1 will be out approximately 1 week.

J-2 ENGINE PROGRAM

Rocketdyne has reorganized within their Liquid Rocket Division to add emphasis to project management on the J-2 program. Personnel from various line functions; i.e., manufacturing, engineering, contracts, etc., have been assigned to the J-2 Project Manager and are responsible to him in seeing that project functions are carried out. Also, these personnel have been relieved of all administrative responsibilities within their respective line organizations, leaving them full time to devote to project responsibilities. Mr. Norman Reuel has been named Project Manager and Mr. Paul Castenholz, Assistant Project Manager. The "projectizing" of line functions at Rocketdyne should result in more efficient management and an overall improvement in the J-2 Engine Program.

H-1 ENGINE PROGRAM

The second burst of instability occurred on engine H-116B which damped in 4 milliseconds and the test continued to scheduled duration. This burst occurred at 2,822 seconds into injector life. The injector was flushed and thrust chamber walls were cleaned post test. Since then five tests have been conducted with no further incident. As reported previously, the first burst occurred at 1,566 seconds into injector life. No corrective action was taken after the first burst in order to establish the repeatability. Tests will continue to determine actual cause of this condition.

GENERAL

As indicated in my February 17 notes, the conversion process involving our Brown Engineering in-house personnel will have a considerable adverse impact on the capabilities of this office and will drastically increase the work load of our civil service personnel. The time frame allowed will not be sufficient for the conversion of our non-technical personnel (15 out of 18) by March 31. Hence, we anticipate that as of March 31 our work force in Huntsville will have been reduced from 63 (45 civil service and 18 BECO) to about 49. LB But JA got lots of nice spaces as compensation! Didn't you? B

NOTES ~~2/27/64~~ 2/2/64 CONSTAN B 2/6

1. THE VISIT OF THE PRESIDENT'S COMMITTEE ON EQUAL EMPLOYMENT OPPORTUNITY

Mr. Hobart Taylor, Executive Vice Chairman, The President's Committee on Equal Employment Opportunity, Mr. Vincent Macalusa, Assistant to Mr. Taylor, Mr. A. S. Hodgson, Employment Policy Officer, NASA Headquarters, Mr. Marion Kent, MSFC, Deputy, Equal Employment Opportunity Officer, visited Michoud on February 19, 1964. A meeting was held with top management and personnel officials of Chrysler Corporation, Boeing, Mason Rust, TSI, and NASA Michoud, to discuss the status of implementation of the Equal Employment Opportunity Program. ✓

2. STATUS OF S-I-8

Final exceptance testing on S-I-8 is continuing. The following is the status of testing:

Measurement Testing----------85% complete
Mechanical Testing----------88% complete
Electrical Testing----------17% complete
RF Testing----------86% complete

Of a total of 708 testings, 571 have been completed for an overall testing precentage of 80%. Anticipated date of completion of all testing is March 15, 1964. ✓

3. STATUS OF S-I-10

a. All engines for S-I-10 have been installed and installation of lox and fuel wraparound lines in process. ✓

b. Installation of fuel and lox suction line is in process (short four valves). ✓

c. Completed installation of Gox pressure system 4 inch lines, tubing installation in process for the Gox system. The 7 inch lox vent line and valve installation completed. ✓

d. Engineering Order/Engineering Change Proposals modifications are being incorporated on the overall booster assembly. ✓

4. S-I/IB Quarterly Review

The third FY 64 Quarterly Review with the Chrysler Corporation has been scheduled in New Orleans on March 3 & 4, 1964. ✓

NOTES 3-2-64 DANNENBERG B 3/6

1. Survey of contractually required technical data submittal documents from Saturn V contractors, being compared with documentation actually received, will then be compared with MSFC Standard 263A Data Submittal Requirements. Study results will be available for discussion at the R&D Council meeting 3-6-64. ✓

2. A total of 99 NAA process specifications have been received as a result of the joint MSFC/S&ID expediting effort. Of these, 22 are approved as written; 54 will be approved upon incorporation of comments; 1 requires complete rewrite, and 21 were found not applicable at this time. ✓

3. Flight Missions - Present status of negotiations foresees 3 types of missions for Saturn IB and 2 types for Saturn V. The IB missions are (1) L/V and CM/SM development, including reentry shots, (2) CM/SM long-duration flights, (3) CM/SM/LEM rendezvous and docking operations (LEM flights starting on 206 at the earliest). The Saturn V missions are (1) L/V and heat shield development and (2) lunar mission simulations (starting at the earliest on 503) and lunar missions.

Problem to be resolved is presently existing maximum S/C checkout rate of 6 p.a. and scheduled launch rate of 8 p.a.; also LEM production rate appears insufficient. ✓

4. EDS and Crew Safety - IB and V are "slow turnover" vehicles in contrast to Saturn I making sensing of control failures more difficult. EDS schematics based on preliminary Specs of Crew Safety Panel are almost ready. Next Panel meeting (3-18-64) will clear up two problems: (1) hot wire engine cutoff requested by MSC to assure cutoff if interface is lost (reason: abort from thrusting booster is marginal for 10 secs around Q-max). (2) Break wire system to sense vehicle break up. (Explosion sensors not available yet.) Cold wire system (mission success!) and no break wire system are desirable from schedule standpoint. ✓

5. Walt Williams Flight Operations Meeting - First joint meeting with 3 Centers (3-4-64 in Washington). In spite of our plea, short notice agenda again contains items which would require more preparation by Centers. Richard, Speer, Golden, and Kuettner going. ✓

6. Panel Review Board - Mueller has received our justification of firm Q-ball requirement for Saturn I. IB and V justification being prepared. Negative action by Mueller not anticipated.

MSC has named Low and Piland as new PRB members. ✓

lee James fyi B

KD
→ But what we need is positive assurance that MSC will furnish us the escape towers for flights 8 and 9! Is that certain now? B

NOTES 3-2-64-FORTUNE B 3/6

1. Electronic Technician Training in Mississippi maybe initiated next fall. At the Governor's request, Mr. Miles Meacham and Harold Hill of North American, James Reetz and John E. Morrison of Boeing, Dick Allen of General Electric, B. U. Jones and myself visited Governor Johnson in Jackson Tuesday, February 25, 1964, to discuss legislation proposed for improving junior college education in Mississippi. We mentioned Mississippi State University's interest in assisting electronic technician training for our stage and support contractors needs. At an industrial technician work shop in State College the preceding week, the junior colleges had agreed that they alone could not meet aerospace industry requirements, State University help being enlisted. The Governor inquired as to the numbers of personnel involved, schedule to be followed and upon conclusion of the meeting, requested that we help form an advisory committee to layout a program which he can present to the legislature. He specifically asked that I serve on the committee, which legal personnel say can be done. I will gladly help, calling on Jim Dowdy and other Marshall personnel whenever they are more familiar or knowledgable with regard to educational programs, training, etc. ✓

2. Equal Employment Opportunity at MTO apparently appeared acceptable to Hobart Taylor, Chairman of the President's Committee on this subject. Marion Kent has probably submitted report on Taylor's visit February 19. Taylor seemed quite pleased with all the colored employees he saw around the construction sites, wondered as to NASA and GE plans along this score as well as what we were doing to improve housing, schools, and recreation facilities for minority groups in the surrounding areas. We pointed out that in many cases colored schools had as good rating, sometimes better, than some of the white schools in the area. Governor Johnson mentioned that his program includes junior colleges for Negroes, and the Harrison County Superintendent of Schools, we understand, is trying to get a junior college in Gulfport for colored students. FHA mortgages are being granted three to a builder around here and they, of course, are based on non-discrimination. Mississippi State Law prohibits hotels, motels and restaurants from feeding or lodging mixed races under the same roof. The Holiday Inn in New Orelean is about the closest place, unless we should call upon Keesler Air Force Base for government visitors, or local minority leaders for other persons. It was interesting to learn KAFB employed 218 minority Civil Service of a total 2,424 as of 30 June 1963, two being GS-12, two GS-9, and nineteen GS-7. Practically all old timers in the training field brought in some Scott Field or other former training centers. One GS-12 is a programmer administrative type and one a panel member on the Board of Examiners. The remainder of the 218 are largely Wage Board employees. Keesler sends announcements of all examinations to the local NAACP Head as well as colored schools. ✓

NOTES 3/2/64 GEISSLER B 3/6

1. SA-5 Flight Results: (a) The roll deviation noted on SA-5 (Reference: Weekly Notes 2/17/64 from Dr. Haeussermann, copy attached) is considered to be an aerodynamic effect as reported at the management briefing concerning SA-5 evaluation results on February 7th. The roll angle and, consequently the disturbing moment gradually increased to a peak value of 80, 400 N-m (56, 300 ft#) at 56 seconds corresponding to an engine roll deflection of 0.5 deg and then rapidly decreased to essentially zero around 80 seconds. Some preliminary wind tunnel test results indicate that a good correlation could be obtained assuming a total fin net misalignment of 0.8 deg (equivalent to average of .2 degrees for each of the four large fins). (b) Onboard cameras have revealed that some debonding within the aft interstage occurred after separation just prior to S-IV engine ignition. The S-IV stage had moved out approximately 7 meters. The inner skin debonded, starting at the forward end, for the full lengthof one panel (size 3.5 x 16 ft). This panel was located adjacent to fin position I towards IV. Located in the same area are one chilldown vent duct and two extensiometers. The failure mechanism is not yet known. → Please keep me posted B

E.G. I understood you to say that correlation was poor at higher speeds, indicating a drop-off in fin effectiveness. B

2. Proposed SA-6 Changes: In order to fly SA-6 with closed loop guidance utilizing the SA-7 guidance polynomial it has been recommended to change the S-I to depletion cutoff. This requires shorter LOX level probes and some changes in the circuitry. It will make the performance of SA-6 very close to that of SA-7 thus eliminating any extra load on the guidance system. In order to evaluate control forces, fin loads and establish the stability ratio more accurately than was possible on SA-5 it has been agreed to fly a variable angle of attack bias up to 4 degrees, the maximum occurring at approximately 70 seconds flight time. The effect on the guidance will be minimal. It is understood that these changes will cause no schedule slippage. → Really?

3. Pro and Con of LES Removal on SA-9 and SA-8: (a) Without the tower, the blunt Apollo nose cone may introduce negative damping in the airflow with resultant instability. Consequently a thorough aerodynamic analysis would be required to assure that this would not be the case; (b) Any Q-Ball mounting directly on the Command Module will require considerable design effort and wind tunnel calibration. The only alternative would be to use the external nose shape of SA-5. We cannot say how much that means in design effort. Any removal of the tower would cause a significant change in dynamic characteristics and require repetition of the dynamic analysis and dynamic testing. The resulting delay of 30 days minimum would not only affect SA-9, but project into SA-10 and IB Dynamic Testing Program; (c) Offloading the LES propellant minimized the performance penalty to less than 250 pounds of payload; (d) Employing the LES will provide some dynamic experience to support manned flights; (e) The difficulties resulting from deleting the tower at this late date will far outweigh any possible advantages.

Dannenberg Ref. point 6 of your Notes of 3-2-64 B

RUSH → Lee James

See also point 6, Dannenberg's Notes of 3-2-64.
Do we, or don't we get the LES tower for SA-9 and SA-8?? B

Phone conv. 3/9/64

NOTES 3-2-64 GRAU B 3/6

1. S-IV-6 STAGE: The S-IV-6 stage was shipped to KSC February 21, 1964. Known discrepant items when shipped were (a) part shortage of high level multicoder #1, four bridge modules, one accelerometer and amplifier and one Emitter Follower. (b) Inadequate Electromagnetic Compatibility Testing and (c) one Temp Probe open. ✓

2. S-I-7 POST-STATIC CHECKOUT: Tubing continuity and status determination have been completed and the S-I-7 stage is undergoing pressure and functional testing in the pressure cell of building 4705. Three systems are not ready for test due to the requirements for changeout of thirteen fuel control pressurization valves for which replacement valves are not expected to be available before March 9, 1964. ✓

3. S-IU-7 CHECKOUT: Structural test and pressure and functional testing have been completed, and the S-IU-7 is presently undergoing alignment checking in Station "D" of building 4708. Due to part shortages, the only flight components available for control component checkout are the Rate Gyro and the control signal processor. ✓

4. S-IV-9 CHECKOUT AT DAC, SANTA MONICA: The continuity/compatibility test of the S-IV-9 stage has been satisfactorily completed and the stage is presently undergoing instrumentation checkout with 22 missing parts affecting 31 measurements. ✓

5. S-IV/S-IVB SPECIFICATION AND DEVIATION REQUEST: A meeting was conducted with the S-IVB stage manager to review the status and methods of handling company specifications for approval. These specifications are generated for processes where government specifications are non-existent. The meeting resulted in a recommendation to send a review team as an Ad Hoc group to DAC to review those company specifications and DR's which MSFC has failed to review and approve in a timely manner. A considerable amount of hardware has been built to those specifications which MSFC has not approved as of this date. ✓

6. GOVERNMENT IN-PROCESS INSPECTION AT MOOG SERVOCONTROLS, INC., EAST AURORA, NEW YORK: A meeting between representatives of this Laboratory, Astrionics Laboratory and Moog Servocontrols was held which resulted in tentative agreement between all parties as to the details of implementing government in-process inspection at the Moog plant. One representative from this Laboratory began extended TDY coverage of the Moog effort February 5, 1964. It is presently planned to provide this coverage on a PCS basis within the next 30 to 45 days. ✓

7. BOEING QUALITY CONTROL: This Laboratory has reviewed the preliminary revised Quality Control Manual, submitted by the Boeing Company, applicable to Contract NAS 8-5608. This is the document that governs quality control policy throughout the Boeing Company and is the beginning step in updating their quality control documents for the S-1C program. ✓

B 3/6

NOTES 3-2-64 GRUENE

SA-6 Status

a. With the preparations of S-I-6, we are on schedule. No major discrepancies were detected yet. Details of modifications in the IU on closing the guidance loop have not been received. Whether these changes will have an influence on the firing date will be determined after the full amount of modifications and availability of components becomes available. ✓

b. You are aware of the bulkhead problem on the S-IV Stage. ✓ It is expected that LVO gets a final decision on actions to be taken on March 2. Impact on schedule will have to be decided if it is known when the S-IV-6 can be assembled with the S-I on the pad. ✓

c. We are checking right now into the possibility of re-arranging our preparations schedule to accommodate an early propellant loading test to get some indications on the bulkhead repairs being taken. ✓

NOTES 3/2/64 HAEUSSERMANN

B 3/6

No submission this week.

NOTES 3/2/64 HEIMBURG B 3/6

1. F-1 ENGINE TESTING (STATIC TEST TOWER WEST):

The test stand lox flowmeter has been replaced with one incorporating all the latest modifications. This removes the restriction of lox flow-rate previously imposed by P&VE Lab due to structural weakness in the lox flowmeter.

A 10.37-second mainstage test was successfully conducted on 2/27. The primary purpose of this test was to establish a baseline of 65 p.s.i.g. lox pump inlet and 32 p.s.i.g. fuel pump inlet pressures for further investigation of turbine inlet temperature spike suppression.

F-1 engine 014 was damaged by a lox pump explosion during a test being run at Edwards Air Force Base on 2/28. The explosion occurred after 110 seconds of operation. Extent of the damage and cause of the explosion are unknown at this time and are being investigated.

2. MTF WORKING GROUP:

Hancock County has demanded compensation for the County Roads affected by our Land Acquisition Program. The principal difficulty in settling this question has been the determination of a legal basis for compensation. Mobile District Corps of Engineers (MDE) has now requested $528,000 (which is not presently available) from MSFC for payment to the County in accordance with an agreement reached between the Office, Chief of Engineers and NASA Headquarters. Hancock County has threatened to barricade the County Roads at MTF by 3/9, unless negotiations are resumed by that date. We understand that Mr. Gorman is aware of this problem.

Negotiations with GE for the first increment of MTF Phase II and III Technical Systems (Electronics, Instrumentation and Materials Lab) are scheduled to begin during the week of 3/16. The GE proposal is due to be submitted to MSFC on 3/9.

NOTES 3-2-64 HOELZER B 3/1

No Report

B 3/6

NOTES 3/2/64 JAMES

SATURN I - SA-6 - S-I-6 and IU-6 arrived at KSC dock on February 18 and the S-I Stage was erected on February 19. S-IV-6 arrived at KSC via Pregnant Guppy on February 22 and was taken to the SAB. The S-IV-6 LOX tank was entered at the Cape to check for possible cracks in the welds which could be the contributing factor to the bulkhead leak as detected by the bulkhead monitoring system. Several cracks were found with the dye penetrant. The majority of the cracks were determined, by grinding the welds, to be surface cracks. Eight of these welds were determined to be leaking. This is three more than originally reported to you. A repair for these cracks consists of drilling a 3/4" hole through the LOX side of the common bulkhead and removing the honeycomb directly under the drilled hole. Replace the honeycomb and plug the hole using a doubler then placed over the plugged hole approximately 1 3/8" wide by 8" long. The doubler will either be bonded or welded depending on tests now in progress at DAC, Huntington Beach. As of 3-2-64, four of these holes have been repaired up to the final welding or bonding process. The remaining four should be finished to this point by the end of the day. The exact schedule impact has not been determined but the best estimate at this time is an erection time for the S-IV of March 11, some 5 days later than the original schedule. If welding is required, greater delay or loss of the bulkhead is a possibility. DAC promised a decision on welding vs bonding last Friday, but as of today, this has not been decided. ✓

W. Tinnermann

What's the reason for the delay? Is this a "domino" type delay? B

S-IU-7 - The S-IU-7 flight ST-124 platform is scheduled for delivery to MSFC April 30, 1964, and will not be available for system checkout. A functional platform will be made available to allow checkout of IU-7 to proceed on schedule. Quality has not accepted this approach and it is expected to be brought up as a problem area in I. U. Presentation on March 3, 1964.

SATURN IB - The Saturn IB Design Review #3 has been scheduled for April 2, 1964 and will cover only vehicle weight and performance. A detailed agenda should be finalized later this week. ✓

This office will initiate action on a number of items as a result of last week's visit to DAC and discussions with Dr. Mueller. ✓

B 3/6

NOTES 3-2-64 Koelle

1. ENGINEERING EXPERIMENTS FOR ORL: The Office of Advanced Studies (Orbital Systems), NASA Headquarters, has asked us to submit a series of engineering experiments, suitable for use on an orbital research laboratory (ORL). We have agreed to help. Research Projects Laboratory will do the overall co-ordination. This office will be the point of contact between MSFC and Headquarters until other arrangements are deemed necessary.

HHK Suggest we emphasize zero-g effects. Ullage controls, gravity vs. capillary forces, etc This is vital for deep-space propulsion development. Suggest you talk to Blumrich, I'm also referring to a recent Boeing presentation along these lines B

This request is somewhat significant since our performance, even though on a small scale, should permit MSFC to supply major experimental suggestions necessary for us to develop technology in support of orbital launch operations, lunar base operations, and cryogenic technology in space for orbital launch vehicles. We hope excellent laboratory participation will result. We consider this a practical approach to enter the field of orbital operations as an active participant.

2. FORTHCOMING FINAL PRESENTATIONS: We have two final presentations scheduled for next week:

Tuesday, March 10: Solid Rocket Application Studies (Boeing)

Wednesday, March 11: Advanced NOVA Studies (Class III and Class IV), by GD/A (K. Ehricke) and Douglas (P. Bono)

Are you interested in having a special summary presentation by these contractors? If so, please let me know what, when, and how long. No time. Suggest you pass me up B

3. LAUNCH VEHICLE COST MODEL: We have just returned from the midterm review of our cost study contracts at Lockheed, STL and GD/Fort Worth. Excellent progress has been made, and it seems that, by July this year, we will have on our 7094 computer the most accurate vehicle cost prediction tool available at this time anywhere in the country. This will not only allow us to project SATURN launch vehicle unit cost for a large number of special conditions, but also for advanced vehicles as NOVA and reusable boosters. We have the cooperation of IO, EX and Headquarter offices in the development of this cost projection tool. It should also help us on budget projections in the long run.

B 2/5

NOTES 3-2-64 KUERS

1. Saturn V, S-IC Stage: On February 19 we had a mishap in our Tower Building. The brakes of a cherry picker crane failed which caused the crane to hit the structural test container with the boom knocking a hole into the skin of the container. The hole is located between two stringers and about the size of a hand. An investigation revealed that a hydraulic packing of the brake failed and that the emergency brake was sticking. This cherry picker crane had just been returned from a routine maintenance check on January 31. This equipment is about 10 years old and has become unreliable. Funds for renewal of equipment like this has been disapproved every year. This is not an excuse for the accident, but is certainly a contributing factor. A relatively simple fix for repair of the container has been designed by P&VE and will be applied this week. ✓

Harry ? Please look into this. Maybe you can help. B

2. Highlights of Events for Structural Assembly of T- Vehicle:

a. Tunnel Bellows (Stainless Steel Products, Burbank, California) have failed in qualification tests; the teflon bearing between convolution and flange froze during cold tests. This might affect the T-schedule. ✓

b. Arrowhead strike was settled after 2 weeks. ✓

K. Heimburg

c. Flat or out-of-contour areas due to weld shrinkage has been discovered on skin sections of fuel containers. This makes the installation of ring baffles extremely difficult and requires a change of the welding technique in order to avoid such shrinkage in the future. ✓

Hardly need them for T-vehicle! No slosh problem! Or am I wrong? B

d. Skin panels for Thrust Structure were erroneously trimmed 1.8" too short. !

e. Four skin panels for Lox container were not modified to latest EO's and had to be returned to Wichita. ✓

f. Although the picture does not look too rosy we have also accomplished some progress: The lower fuel bulkhead has been welded to the skin section; the meridian welding of the lower Lox dome has been started; the intermediate rings are being installed into thrust structure; the assembly of the 1/2 intertank section to the fuel test container has been completed; outlet welding in gores for upper lox bulkhead is well underway. ✓

B 3/6

NOTES 3-2-64 MAUS

1. PRESENTATIONS ON MSF INSTITUTIONAL FUNCTIONS - A group of 7 to 10 people from MSF, including Bob Freitag, Bill Lilly, and Clyde Bothmer, propose to visit MSFC in the near future to explain the functions of their offices. In addition to the institutional functions, a representative of Mr. Vecchietti's organization will review the new procurement procedures. March 26 is tentative date.

   We were assigned action on this by Mr. Gorman. Chris Andressen is in charge of local arrangements and coordination with Headquarters. ✓

HM

I'm returning only around noon that day from an (inescapable) speaking engagement in Orlando.

B

NOTES 3-2-64 McCartney B 3/6

1. REPLACING OBSOLETE CAPITAL EQUIPMENT: On February 20, Mr. Read of my Facilities & Materials Group completed arrangement with five laboratories to fund replacement of selected obsolete capital equipment. New equipment will be funded using $2M of the unencumbered Saturn V funds in "blocked accounts." Three laboratories do not require equipment replacement money at this time. The obsolete equipment will be turned over to Technical Services Office for appropriate disposition.

McC, Maybe you can get Kuers a replacement for his troublesome Chevy-picker that recently bumped into our first SEC tank. B

2. RESOURCES MANAGEMENT CONFERENCE: On February 18, we held our second regular meeting of the Resources Managers Conference. These conferences, scheduled after each R&D Council Meeting, are an essential element in assuring full coordination and exchange of ideas among R&D Operations Resources Managers.

3. YEAR-END UNENCUMBERED FUNDS STUDY: The Saturn I and IB unencumbered funds study has been completed. In my 2-10-64 Notes, a probable figure of $12M year-end unencumbered funds was indicated. Further effort has now established a final figure of about $17M. We have released that figure to Financial Management Office for placement in "blocked accounts."

4. MANPOWER: On February 27, we completed distribution of the remaining 55 FY-64 Civil Service spaces allocated to R&D Operations. That brings R&D Operations to a total, permanent, Civil Service strength of 4901. ✓

5. FY-66 CONSTRUCTION OF FACILITIES PROJECT JUSTIFICATION: FY-66 Construction of Facilities projects apparently will be justified by other than direct Saturn project requirements. Mr. Shepherd has agreed to provide us with appropriate guidelines. On receipt of these, we will prepare the justifications required, in anticipation of the NASA Headquarter's call for our FY-66 facilities requirements. ✓

B3/6

NOTES 3-2-64 MRAZEK

1. COMMON RECIRCULATION SYSTEM: MSFC top management has concluded that common recirculation systems are required for the S-II and S-IVB stages. This Laboratory will define those parts of the systems that can be common. We have tried unsuccessfully to provide common hardware, however, Industrial Operations did not want to establish common items as Government-Furnished Equipment.

Bob Young
What route does I.O. recommend? I think the idea of a standardized recirculation system is both sound and economical. After all, its the same J-2 engine! Maybe re-circulation hardware could be added to J-2 contract package, with Rocketdyne supplying the systems to S-II LD and Douglas.
B

2. S-IV-6 COMMON BULKHEAD CRACKS: KSC reported that they had inspected LOX side of the common bulkhead and found two cracks in the meridian welds adjacent to the wrinkle. The cracks are 90 degrees to the weld seam. These cracks were found by using die-penetrate method and soap solution. They have pressurized the common bulkhead to 3 psi using helium. After 3 hours, they had not detected a bubble; however, after 4 hours they verified communication through the cracks. A total of five cracks have been detected and communication through the welds has been established with 3 psig helium.

3. S-IC WORKING GROUP MEETING: The seventh S-IC Vehicle Mechanical Design Integration Working Group meeting was held 2-26-64. The meeting consisted mainly of status reports and design reviews. No action items resulted.

Oswald Lange
ftl
B

4. POGO INSTABILITY (SA-5): Results from SA-5 flight evaluation indicate that no "Pogo" instability existed throughout first and second stage flight. This was shown by comparing engine chamber pressures with an accelerometer measurement in the instrument unit. At points in flight where small oscillations in chamber pressures were indicated, the accelerometer did not have a corresponding response. It is recognized that only a small number of accelerometers, with correct low-frequency response, were available to detect such oscillations; however, the fact that the engine chamber-pressure measurements showed very little oscillation confirms that there were no existing forces to start structural oscillations.

5. S-IV ALL-SYSTEMS VEHICLE: A preliminary report (classified Confidential) from the Ad Hoc Committee was forwarded to Dr. Mueller, NASA Headquarters, for review. The independent analysis of the helium pressurization flowrates performed by the Fluid Mechanics and Thermodynamics Branch of our Propulsion Division substantiated the previous analysis made by Douglas Aircraft Company. This flow analysis was conducted to determine the source of helium pressurizing flow to the LOX tank during the time span of 290 seconds prior to the explosion. For the first 260 seconds, approximately half the helium flow was coming from the vehicle's cold helium spheres and half from the ground helium supply. During the last 30 seconds, all of the helium flow was coming from the vehicle's cold helium bottles. A final report will be published approximately 3-19-64.

NOTES 3/2/64 RUDOLPH B 3/6

1. Saturn V Weights and Performance Meeting was held Feb 19, 64, to reach R&DO/IO understanding on current weights criteria and the criticality of current weights and performance. The following actions resulted:

a. P&VE to update F-1 and J-2 performance definition, including vehicle effectivity, before end of March (possibility that nominal Isp's have to be reduced). ✓

b. P&VE and AERO to review Saturn V specification and control weights, based on a. above, by April 15. (MSF has indicated that within 6 weeks they would propose revised specification and control weights to us.) ✓

c. Saturn V Project Office to negotiate revised specifications weights into applicable contracts immediately upon completion of b. above. (DAC has no weight number whatsoever in the current S-IVB contract.) ✓

d. Saturn V Project Office immediately require all stage and engine contractors to reinforce weight control activities and submit detailed weight savings proposals. (S-II and S-IVB stages have been lagging in this activity. No specific effort has been required of the engines to date.) ✓

e. R&DO and IO begin immediate investigations toward strengthening internal MSFC weight control procedures. Specifically, P&VE to prepare priority lists for all known weight savings possibilities for each stage, engine, and instrument unit by March 19, 1964. ✓

2. S-IC Stage:

S-IC-T Status - The fuel tank is presently reported to be six weeks in delay. The behind status on the fuel tank is not too critical in itself because there is a storage period for this tank prior to mating with the thrust structure.

On Feb 20, 64, brakes failed on a mobile crane and collided with the test fuel tank puncturing a hole, approximately 6x8 inches, in the tank skin between two "T" stiffners. MSFC and Boeing are collaborating to determine the mode of repair. No impact on start of structural testing is anticipated at this time, as the test facility will not be available until March 10, 1964. ✓

3. S-II Stage:

Computer Programming - Automation Sub-board #4 has requested that ATOLL (Acceptance Test or Launch Language) computer programming be implemented on the S-II Stage. Action with S&ID is being taken to resolve the effectivity of this change and cost impact.

Common Recirculation System - Meetings have been underway at P&VE to implement a common recirculation system for the S-II and S-IVB Stages.

4. ST-124-M Platform Systems - Astrionics Lab has submitted a work statement to Sat V I.U. Office for 26 additional ST-124-M platform systems for the Saturn IB and V Programs. This office is pressing to complete the RFQ for the procurement as soon as possible. ✓

A.R.

→ Urazek says in his Notes 3/2/64 that I.O. hasn't accepted their recommendations. Please clarify.

B

B 2/6

NOTES 3-2-64 - SHEPHERD

FY-66 C of F Program: The proposed Marshall C of F preliminary budget was reviewed by Dr Rees and Mr Gorman on February 17. Since guidelines from Headquarters had not been received, the projects included were based on the following MSFC guidelines:

a. Submit those projects required to accomplish approved programs and/or missions and to maintain a competent level of supporting technology. ✓

b. Saturn Facilities will be based on Schedule "J_1". ✓

c. Facilities in support of new starts or follow-on programs will be treated independently after receipt of Headquarters guidelines. ✓

d. Total lab and office space to rpovide for 8,000 civil service, 4,000 contractor personnel. ✓

e. Modifications to existing facilities are to be considered before new facilities are requested. ✓

As presented, the totals by location were as follows: Huntsville, $27,394,000; Michoud, $6,691,000; Mississippi, $9,975,000; Various Locations, $19,916,000; Grand Total, $63,974,000.

Dr Rees and Mr Gorman stated that the following facilities should be added to the program for FY-1966:

a. Facilities for the Cryogenic Module Program.
b. Facilities for the 3rd Stage Saturn IB Program. } ✓

c. Space Simulation Chamber for Support of the Lunar Logistics Program. ✓

d. $3,000,000 for modification of existing Huntsville facilities.

A briefing will be held for you prior to finalizing this budget. ✓

Advance Design - FY-64: We have requested Advance Design Funds on 18 FY-65 CofF projects totaling $4.046M. As of today, we have received all of this amount. It is quite urgent that we prepare criteria, select architects, and begin our design of the FY-64 program. In addition, $1.3M has been requested for FY-66 and subsequent fiscal years. To date we have not received any approvals against this request.

Stuep

65?

B

Long's Office of Construction: On Feb 24-28, 1964, Col J. V. Sollohub and Capt H. H. Loeffler of the Office of Construction, visited Huntsville, Michoud, and Mississippi Test Operations. They reviewed the MSFC mission, organization, personnel, responsibilities, and staffing for current and future construction and maintenance programs. At Michoud and Mississippi they toured facilities and met with George Constan, Bill Fortune, and Mr Kennedy of the C of E area office. They were briefed on the functions and seemed satisfied with the progress of activity. ✓

B 3/6

NOTES 3-2-64 Stuhlinger

1. SA-10 PAYLOAD: Fairchild Stratos Corporation's contract is being modified to permit them to conduct the feasibility study with which you are familiar. They initiated effort under the Modification on February 24 and will complete the study by March 20. OART has not made a final selection of experiments; however, RPL has selected three definite experiments, nine probables, and is reserving the final six experiments on the OART list as possibilities dependent upon the development of the Fairchild study.

In consonance with the conversation between you and Dr. Bisplinghoff, ME, P&VE, and other Laboratories are starting work on the IU required as an adapter for the payload. ✓

2. ALSS PAYLOADS - SCIENTIFIC INSTRUMENTS: When we were visited by Dr. Verne Fryklund of OSSA last July, he stated that he wished to monitor and control the work on the ALSS scientific mission planning, etc., from Headquarters. Apparently he has not changed his mind as he recently advised us that he will technically direct the contractual effort on the MOLAB scientific instrument package. The contract for defining the experiments and instrumentation for MOLAB will be directed by Mr. Don Beattie who works for Major Tom Evans at OMSF, but who will also report to Dr. Fryklund for this study. The MOLAB preliminary design contract(s) will be let by MSFC and directed by Joe deFries. RPL is expected to continue in-house studies on experiments and instrumentation, provide liaison between the MSFC MOLAB design contractor and Beattie's scientific package contractor, and assist in supervision of Beattie's contract. ✓

3. THERMAL CONTROL OF SA-5 NOSE CONE: Upon request by Astr and Aero, the black temperature control paint was specified by RPL on the basis of a thermal design analysis, developed by P&VE, and applied to Saturn by ME. The main purpose was to maintain the minitrack beacon and its batteries in an operable temperature range during their 45-day battery lifetime. The beacon on SA-5 was still in operation after 31 days in orbit. Four temperatures are being telemetered: transmitter, battery in nose cone, battery in IU, ST-124 mounting ring in IU. The passive temperature control works well, keeping temperatures close to predictions. Transmitter temperatures range from 269 to 286°K, following predicted time in sunlight variations. IU temperature measurements, which are being made for correlation of results, indicate that the temperatures inside the IU are too cold (below 273°K). Conclusions for future Saturns are: The transmitter beacon will be in the IU; The IU will be temperature controlled for operation during the orbiting period; a black paint similiar to the one in SA-5 will be used. A detailed memo will be issued after completion of analysis. ✓

March 9. 1964

NOTES 3-9-64 BELEW

F-1 ENGINE PROGRAM

The F-1 Project Manager spent 2 days in Washington this week for the purpose of discussing the $158 million F-1 production contract (NAS8-5604), submitted approximately 1 month ago for final NASA approval. The contract is running into major opposition from the procurement side of the house where facility oriented types have recommended disapproval of the contract until resolution of the overall question of "NAA participation in capitalization of facilities." A call by myself to Gen. Phillips on Tuesday evening resulted in a meeting with our representatives in Washington with the following conclusions: (1) Gen. Phillips will write a letter to Mr. Vecchietti recommending a NASA/MSFC/MSC Task Team be established to investigate "NAA participation in capitalization of facilities" versus "Government investment," and further, to assist in establishing NASA policy concerning this matter. (2) Gen. Phillips will recommend that this contract be approved in the meantime, since no NASA policy was available to MSFC at the time of negotiations and that NASA has already been under letter contract almost 2 years.

A team from MSFC (Test, P&VE & EPO) are currently at Rocketdyne reviewing all available data on the recent turbopump explosion which took place on R&D engine 014 last week. No definite conclusions have been reached yet.

H-1 ENGINE PROGRAM

The first production 200K engine will be subjected to acceptance firing on March 9, 1964. Rocketdyne has established a target date of March 16, 1964 for submittal of a budgetary and planning estimate on injector development work to provide higher specific impulse for the 200K engine configuration. No further bursts of self-induced instability occurred in the R&D program during this report period. One additional R&D injector, of the production configuration, has been bombed eight times at thrust levels ranging from 197K to 206K and self-damped in all tests. One engine has been tested for 4,342 seconds at thrust levels above 200K.

J-2 ENGINE PROGRAM

Rocketdyne has initiated analytical studies to determine feasibility of decreasing the thrust chamber expansion ratio to 14 to 1 and adding detachable skirts of expansion ratios up to 45 to 1. Also, testing of a 14 to 1 thrust chamber on a component test stand will be initiated soon. A preliminary program and cost estimate on a 14 to 1 J-2 engine improvement program is in preparation. Persuant to the discussion at Rocketdyne on February 26 concerning improvement of the J-2 engine by changing to a toroidal aerospike nozzle, Rocketdyne has been directed to prepare a preliminary program and cost schedule. Mr. Hege, Rocketdyne, will be prepared to come to MSFC and discuss the program at any time after March 17. We will arrange for such a meeting, should you desire it. Preliminary configuration drawings on the J-2 aerospike engine have been furnished P&VE Laboratory for use in uprated vehicle studies.

→ Yes, I'm greatly interested B

RL10 ENGINE PROGRAM

As mentioned in my notes last week, we are taking action to modify RL10 engines originally ordered for earlier vehicles, to use them most effectively for current vehicle requirements. We are modifying 16 additional RL10A-3 engines which were previously procured for Saturn and Centaur to the latest engine configuration so they can be used in the Centaur program.

This action will make it possible to reduce the number of new engines on order by 13, while at the same time covering firm delivery requirements for Centaur through June 1967.

NOTES 4/9/64 CONSTAN

1. SI

The final acceptance testing of S-I-8 is continuing. Overall testing is approximately 72% complete. The remaining tests to be completed are Cutoff Test, T. M. Calibration, and Simulated Plug-Drop. The estimated date of completion of final acceptance testing is March 19, 1964. S-I-10 is scheduled to move into final checkout as soon as S-I-8 is removed.

2. S-IC

The Boeing manufacturing drilling operations have been of an unacceptable quality level. In order to correct this condition, a meeting was held with Boeing's Quality Control Management. Boeing initiated action to preclude increase in percent defective ratios in hardware drilling operation.

3. S-IC-T Instrumentation Delivery Schedule

Presentation by Boeing (Mr. Bogart) on March 6 on S-IC-T Instrumentation Delivery Schedule indicates a delivery slide from April 1964 to November 1964 of the Liquid Level System. This slide is a result of a vibration specification change as impacted by the vendor (Transonics). This specification change was requested by MSFC. Manufacturing Engineering Laboratory required date is April 1964. This problem is being brought to Huntsville for coordination and resolution. → Karl Heimburg hope we can do something about this!

4. Modification 62 to Contract NAS8-5608 (Boeing)

Modification 62 is in NASA Headquarters for evaluation. This Mod is for support to MSFC which is accomplished by individual Task Assurance Orders. The effort is being extended by Mod 62. Headquarters is questioning whether this Mod is a sole source justification for SATURN V work to the Boeing Co. and is further questioning whether this is a personal service contract. Both of these questions have been discussed with NASA Headquarters and we have furnished assurance that this Mod has no intention of establishing sole source justification for the SATURN V mission support. We have further advised NASA Headquarters that this effort is not personal services since it is support to MSFC in the areas of inter-related activities for the S-IC program for which both MSFC and The Boeing Co. have designated responsibilities.

5. Support Services Contractor - Mason-Rust

The existing contract between the support services contractor, Mason-Rust and the Metal Trades Council has been extended from midnight, March 3, 1964 to midnight March 18, 1964. The Metal Trades Council has agreed to resubmit this proposed contract offer made by the Mason-Rust Co. to their employees for gratification. This proposal was submitted earlier and rejected by the membership of the Metal Trades Council. The Metal Trades Council feels that with better explanation to the members that they will accept the proposed contract. The voting for the possible radification of the contract will be accomplished on Thursday, March 12, 1964. Outcome?

fw 3/9

B 3/18

NOTES 3-9-64 DANNENBERG

1. Flight Missions - For lack of a decision who in Marshall shall be responsible for Flight Mission assignments, the small group appointed temporarily to deal with Tommy Thompson (Kuettner, Ise, Vreuls, & Winch) is hammering out the mission assignments and coordinating the results within MSFC. Mueller has implied that MSFC is holding up the mission assignments. Therefore, a decision may have to be made later this week in another meeting between the Centers, MSF, and Bellcomm. With both you and Dr. Rees out of town for awhile, we want to have your backing before committing ourselves and will brief you on Wednesday morning. (Set up for 10:15 to 11:00 fw) ✓

Saturn IB program foresees now 12 launch vehicles including 2 backups. Except for the 2 backups, every IB and Saturn V vehicle will have an assigned payload. There will also be 3 boilerplate payloads as backups. ✓

The "all-up/earliest manned flight" concept puts the pressure on a "qualified" EDS, which becomes the pacing item for first manned flight. ✓

2. EDS - MSC has suggested to look from a crew safety standpoint into ozone difluoride additive to LOX which makes LOX/LH_2 hypergolic, preventing explosion. Abort from hydrogen stage explosion still problematic, because of SM destruction by pressure peak. (O_3F_2 so far considered for ignition redundancy only)

Final EDS design go ahead to contractor for Saturn IB and V is expected for early April. Remaining differences between Centers on EDS specs will be ironed out next week. ✓

Is he really leaving NASA? Who'll succeed him?

3. Flight Operations Meeting - First joint Center meeting with Williams in Washington was useful and informative. Emphasis was on implementation of flight operations organization prior to each flight and on range instrumentation requirements (specifically Bermuda). Next meeting in two months. ✓

4. A comprehensive "human standards" guide for Apollo issued by Headquarters was reviewed by MSFC and comments were sent out. ✓

KD

Our friend, Dr. Aristide Grosse of Temple University in Philadelphia has worked extensively with this stuff. Heller and Stuhlinger know him well. Suggest we consult him. Pure O_3F_2 is extremely shock-sensitive, if I remember correctly. But diluted in LOX may be o.k. B

NOTES 3-9-64 FORTUNE

1. Speaking Demands Again on Increase: MTO had fifteen speaking engagements in February, five of which demanded my participation. Henry Auter gave a well received lecture on testing, third of a series on "Space Flight and Rocketry," at the Crosby Memorial Library, Thursday night, February 27. March requirements should be almost as heavy. In our speeches, we bring out equal employment opportunity as a way of life here, hoping to acclimate native Mississippians to this without unduly arousing them. Incidentally, GE hired a colored mail clerk last week.

2. Mississippi Mud Traps Visitors: Rod Diaz, Colonel J. V. Sollohub and Captain H. H. Loeffler of NASA Headquarters and Colonel Palmer obtained first hand information about MTO roads during their visit on February 28. They unfortunately got stuck while on a tour of the facility. Bob Young was exposed to this situation during his visit on March 3 but was able to get to those projects having the better access roads.

3. MTF Activation Plan: The MTF Activation Plan was approved by the MTF Planning Board and has been published and distributed on March 4 to MSFC and contractor personnel most directly concerned with MTF Activation.

4. MTO Huntsville Office: All MTO personnel in Huntsville are now located in trailers north of building 4566 in Test Area. Suite in building 4200 has been vacated. This consolidation will provide for efficient utilization of our limited personnel and will permit better integration of MTO, Facilities and Design Office, MTF Working Group, and General Electric personnel.

FW 3/4

NOTES 3/9/64 GEISSLER B 3/12

1. S-II Stage Vehicle Dynamics and Control Working Group Meeting: The subject meeting was held at Downey, California, with NAA-S&ID on February 25, 1964. Two tentative action items resulting from the meeting are: (1) It is agreed that the skirt of S-II stage can be separated at second plane separation under adverse condition such as engine out and additionally the S-II stage can be controlled for the engine out case from ignition to propellant ~~deflection~~ depletion. Capability for engine out second plane separation will be obtained by modifications to the control system hardware in the IU and therefore will not represent a design change to S&ID. (2) S&ID will study the S-II control capability during the actuator hardover failure mode including roll, yaw, and pitch coupling.

2. ALSS (MOLAB): As a follow-up of Dr. McCall's letter to Dr. von Braun suggesting a review of the ALSS, I would like to propose that first we get a status report on the subject, in order to have all the facts at hand, and then follow-up with a policy discussion. Mr. de Fries stands ready to organize a presentation with the MSFC study groups for the last week of March. If you agree, please indicate and the date will be arranged. E.F. I agree 100% B

3. Flight Operations Meeting: Dr. Speer attended the first Flight Operations Meeting (FOM) under W. Williams in Washington on March 4. W. W. reemphasized that he does not want to change the Apollo panels. While panel activities are directed toward long range problems, the FOM are intended to discuss and resolve more immediate problems. The FOM should be attended by those key people who will directly participate in flight operations (e.g., KSC test conductor, etc.). Gemini experience will be utilized and disseminated. From now on the Apollo Operations Office (Holcomb) intends to coordinate all ground instrumentation requirements and to direct their implementation. The validity of our requirements, for instance, would be decided there. Holcomb wants to change our requirement documentation format again; MSC and Dr. Speer objected. W. Williams promised his help in establishing precision tracking instrumentation on Bermuda for launch vehicle R&D. W. Williams is establishing a NASA Flight Operations Support Office at Cape Kennedy as single interface to Gen. Davis' DOD Support Office. MSFC will also be asked for a representative in this office. The next meeting is scheduled in early May. The first meeting was valuable; however, it is too early to assess how the FOM will really affect our panel activities. What's the impact of Williams' alleged leaving NASA on all this? B

E.F. For launch vehicle R&D flights, this is not acceptable. For manned flights o.k., but we must reserve right to reclama case upstairs if they cut out vital measurements B

E.F. Tell Speer to stick to his guns. I don't think that Holcomb will be backed by Mueller and Phillips B

NOTES 3-9-64 GRAU

1. S-I-7 POST-STATIC CHECKOUT: Post-static pressure and functional testing of the S-I-7 stage continues in the pressure test cell of building 4705.

2. S-IU-7 CHECKOUT: The S-IU-7 Instrument Unit is now undergoing electrical checkout in Station "D" of building 4708. Due to the late arrival of the ST-124 Stabilized Platform, Platform Electronics Box, Flight Control Computer, Control Accelerometer Switch, Minitrack Transmitter and Guidance Signal Processor, this Laboratory is investigating the possibility of modifying the S-IU-7 schedule to allow for complete systems checkout.

3. SYSTEMS CHECKOUT WORKING GROUP MEETING: The Systems Checkout Working Group held a meeting at KSC on February 17-18 to discuss and resolve problems raised by KSC's proposal to curtail low bay pre-mate stage checkout in the Vertical Assembly Building. The Working Group recommended that MSFC adopt the proposal and agreed upon guidelines to be followed in implementing same.

4. PROCUREMENT REQUEST QUALITY REQUIREMENTS REVIEW: Between September 28, 1963 and February 11, 1964, the following disposition was made of procurement requests from MSFC Laboratories:

		% of Total
TOTAL NUMBER OF REQUESTS	17,473	100.00
Inclusion of NPC 200-2 (one request of 4.75 million dollars value to Allis Chalmers for fuel cell power supply systems, one request of 9.2 million dollars value to Bendix Corp., Eclipse-Pioneer Division for ST-124 stabilized platform design, documentation, and prototype fabrication)	2	.01
Inclusion of NPC 200-3	129	.74
Inclusion of In-Process Inspection	153	.88
Inclusion of Quality Requirements (such as workmanship, or military specification)	1866	10.68
Untouched (not flight hardware or GSE, but laboratory equipment, stock replenishment, office equipment and supplies, study and construction contracts, and various supplements)	15323	87.69

Due to the method used by the Financial Management Office in the accounting of procurement requests, an estimate of the dollar value to be attached to these figures cannot be obtained without considerable effort.

5. S-IV/S-IVB ORIENTATIONS: A series of orientations were given to S-IV/S-IVB Industrial Operations personnel on the planning and activities of the Quality and Reliability Assurance Laboratory in regard to the S-IV and S-IVB programs. These orientations were designed to explain to Industrial Operations the nature and extent of our participation in these programs, and to define in moderate detail the quality and reliability requirements which must be applied in order to assure quality stage systems hardware.

Jw 3/9

NOTES 3-9-64 GRUENE B 3/18

SA-6 Schedule

*Jw 1. Repair work on the S-IV-6 bulkhead was completed over the weekend. At the present, cleaning and leak check operations are in progress. Because of this repair, the assembly to the S-I on the pad was delayed from March 6 to March 13. We will immediately investigate whether a re-shuffling of the DAC S-IV-6 checkout on the pad will make it possible to keep the originally planned firing date. I am confident that we can rearrange our schedule accordingly without adding unreasonable overtime requests.

2. Electrical changes necessary to accomplish closing the Guidance Loop already on SA-6 are in progress. This change will make another re-shuffle of the launch preparations schedule necessary.

3. The MSFC request to take a certain amount of ballast out of the spacecraft and its influence on the firing schedule is being investigated at the present time by Preston's people.

NOTES 3/9/64 HAEUSSERMANN

1. EFFECT OF SA-5 POSTFLIGHT EVALUATION ON SA-6 G&C SYSTEM: The SA-5 evaluation does not reveal any information which would require alteration of control and guidance system implementation presently planned for SA-6. (Sloshing observed on SA-5 between 50 and 100 seconds of flight time appears to be the dynamics of most concern since this oscillation required control engine deflection of approximately 0.8 degrees (peak to peak).)

2. SA-9 SCHEDULE PROBLEM: The slip in start of the SA-9 dynamic test and the lack of elastic body data from theoretical analysis begin to reflect as a serious scheduling problem for release of shaping networks gains for SA-9.

3. SATURN IB LAUNCH VEHICLE ACCESSIBILITY - COMPLEX 34: Current plans do not provide for vehicle access after the removal of the service structure. Since the service structure is removed several hours before launch, costly delays could occur in the event of malfunction of equipment at various points throughout the vehicle. Incorporation of access provisions in the umbilical tower is being studied jointly by ASTR and KSC, Mr. Poppel.

4. ST-124 ALIGNMENT TESTS: Another series of alignment tests have been scheduled at KSC. These tests will run concurrent with SA-6 checkout at pad 37. An updated theodolite has been delivered from Perkin-Elmer to KSC and will be checked out in conjunction with these tests. The tests include RCA 110 computer program tests and complete system tests with use of SA-6 flight ST-124 platform and ground operational support equipment.

5. STATUS REPORT - S-IB VEHICLE INSTRUMENTATION WORKING GROUP: A meeting was held at Michoud February 26, 1964. At the meeting all major points were resolved on the S-IB-1 IP&CL (Measurement Program). No major problem areas are known to exist in the instrumentation system for this stage.

6. RATE GYROS: Information you requested recently is provided in attached document.*

7. STATUS REPORT - ELECTRICAL SYSTEM DESIGN INTEGRATION WORKING GROUP: A meeting was held at MSFC 2/18, 19, and 20 covering Saturn I, IB, and V. The following items were among those discussed:

a. DAC proposed and it was agreed that a battery be added in parallel with the present S-IV-6 telemetry battery. This will extend the life of the telemetry system for one complete orbit and provide temperature and other data that may be of value in the S-IVB program.

b. Each of the Saturn V stage contractors has under development a cathode ray tube display system for use with the checkout computer. Each contractor has been asked for a cost estimate of his display system plus the cost of developing the computer program associated with the display. An evaluation of these systems, considering costs, will be made by 4/1/64, and the contractors advised which system to use.

* Copy of attached document distributed to M-DIR and R-DIR only.

FW 3/9

NOTES 3/9/64 HEIMBURG

1. F-1 ENGINE TESTING, STTW: After the pump explosion on engine 014, Rocketdyne recommended that we dye penetrate check our impeller before we fire again. The impeller was checked 3/6, but no cracks were found. On 3/7, Rocketdyne called and stated that impellers would be replaced after 1000 sec. of operation. Engine F-1001 has a total time of approximately 750 sec., so it has been decided to replace this impeller. When the pump had been disassembled, it was observed that an object had gone through the impeller and the pump. There is no way of knowing if the object had entered the pump here or at Rocketdyne. The decision has been made that the lox pump seal will be replaced while the pump is open and that the turbine wheels will be inspected since we have had temperature spikes in the turbine.

It will take approximately 2 to 3 weeks to receive an impeller that is balanced like the existing impeller. Since it is desirable to remove the lox dome and look for the foreign object, the engine will be removed from the stand 3/9, and all repairs and modifications will be made in the engine prep shop.

The next firing will not take place before 4/7, due to all work required and the firing of SA-9 on the east side of the tower. During this down-time, outboard lox and fuel PVC lines will be installed and a flight-type vertical suction line bracket will be installed for their support. When actuators become available, gimbaling will be started.

Mr. Beduerftig and Mr. Gross of P&VE and Mr. Goetz of Test went out to Rocketdyne last Tuesday to investigate the pump explosion on engine 014. Results will be published later.

2. MTF WORKING GROUP: Compensation has been requested for restoration of Hancock County roads which were affected by our Land Acquisition Program. Mr. Gorman's letter of 3/5 to Col. Raymond authorizes Mobile District Corps of Engineers to proceed with negotiations with Hancock County officials to arrive at a firm plan and firm cost figures. These data are required to substantiate documentation to be forwarded to NASA Headquarters. Necessary approvals and authority from Headquarters will take about 60 days.

We understand that NASA reprogramming action to cover remaining fund shortage of $2.275M, existing in the MTF Land Acquisition Program, has been signed by Dr. Seamans and forwarded to Mr. Webb.

3. MARINE TRANSPORTATION: Barge Promise inventory completed 3/5. The inventory and Promise have been transferred from Test Lab to Project Logistics Office. This completes transfer of equipment. Operational responsibility was transferred on 2/16.

Meeting was held on 3/6 with the marine contractor at Michoud concerning barge operations. Mr. Ohler, Vice President of A. L. Mechling Barge Lines, is satisfied that his personnel have had sufficient experience and training to operate the barge Promise.

Meeting was held on 3/6 with Michoud Facility Engineering personnel concerning "fair leads" for improving barge moorings leads at the Michoud Pier.

Specifications for reactivating the Palaemon were completed 3/6.

NOTES 3-9-64 HOELZER B 3/25

PURCHASE OF COMPUTING EQUIPMENT: During the past two years GAO has audited all computer installations in the government and a common recommendation made is that computers be purchased instead of leased. The basic assumption made by GAO is that the computing equipment presently installed will remain for a number of years (4 to 5). Using this assumption, GAO claims the government can save about $150 million by purchasing. Our Center leases its digital computers due to the flexibility gain and to maintain modern equipment. As you know, the computer industry is moving very rapidly and advances are being made almost daily. There are many other intangibles on the side of leasing. However, Budget Bureau requested NASA to submit to Congress a line item for some $65 million to purchase computers in FY-65. Some $23 million of this has been tentatively assigned to MSFC to use for purchase. This represents about 80% of the equipment we have installed. We are now preparing a Center position on this item to be ready for discussion at the next Management Council Meeting if deemed appropriate.

H.H.

I don't think the Management Council is a suitable platform to discuss this. I'd rather suggest we
— either accept GAO's dictum (which seems to be a nationwide directive)
— or present our special situation in a carefully worded letter to Dr. Mueller, requesting further action to stave off the buy. Suggest (in the latter case) you enlist Ray Kline's help in drafting the letter.

B 3/25

FW 3/9

B 3/25

NOTES 3-9-64 JAMES

SATURN I - S-IV-6 - The decision was made to bond the eight leak repairs in the LOX side of the common bulkhead. All leaks have been repaired and the bulkhead leak test completed without leaks. LOX tank cleaning has been completed with gas and cleaner samples in the lab to determine cleanliness. The stage is scheduled to go to the pad on Friday, March 13, rather than March 11 as indicated last week. It is not believed that this will have any effect on the launch date.

*FW S-IV-7 - As a result of the S-IV All Systems Stage investigation, DAC has been directed to perform propellant loading tests on S-IV-7 at least one week prior to static firing, and to provide cut-off buttons for red line and pill box observers. The one week period is required for analysis of test records, common bulkhead inspection, and repair and checkout systems. The Douglas estimate for arrival at AMR is June 19, which is approximately two weeks behind schedule, based on planned launch of SA-6. It is believed this delivery to AMR can be accelerated.

*FW S-IV Contract - Negotiations on realignment of the S-IV Stage contract with Douglas began on March 9 and will include incentive considerations for the balance of the S-IV program.

SA-10 Payload - ME Lab has started work on critical items for the manufacture of the IU and the IU adapter for the SA-10 payload. In view of the current launch date for SA-10, the time remaining to procure and manufacture the advanced micro-meteoroid payload is quite critical. Everyone should be aware that, even with an immediate go-ahead, the schedule required will be a tight one to maintain the SA-10 launch date.

I. U. - Reference my note last week regarding late delivery of ST-124 for IU-7, I am preparing correspondence to Mr. Weidner requesting the R&D position on check-out without flight hardware and also the position on the control computer filter design for IU-9 based on the delay in SA-9 dynamic testing.

SATURN IB - Performance - This month's P&VE weight report reflects a payload loss of more than 350 lbs. This critical problem of payload capability will be discussed in detail at the Saturn IB Design Review on weight and performance scheduled on April 2, 1964. For the next Management Council Presentation, it is planned to include certain conservative estimates of performance increases that have not been officially incorporated into the weight reports. These will offset the 350 pounds and will show an appreciable gain over last months report. An example is the effect of partial J-2 mixture ratio shift. (This paragraph not to be included in report to NASA Headquarters)

Aug 19 X

NOTES 3-9-64 Koelle B 3/25

1. HIRSCHLER PRESENTATION: You might remember that Mr. Hirschler (AMC) was real eager and insistent to present to you a new and "earth-shaking" concept for reusable boosters. I have heard his presentation now, and it turned out to be a revival of the annular wing concept for the SATURN. The only new thing he had to offer was a horizontal landing of such a device. But even this was not described in detail. I explained to him and his associates what the situation really is in the field. They now understand that they had no revolutionary idea. They were, however, a little disappointed as inventors occasionally are. ✓

2. SATURN LAUNCH COST: On this problem we are somewhat "boxed in" as we have stiff competition. This produces a conflict between the project people, who want to play it safe to get all the funds they need (for all justified and not-so-well justified requests), and the marketing people, who want to be competitive. There is no simple answer to this problem. You know that we are presently running another costing exercise for Dr. Mueller (under the chairmanship of the Executive Office), which is due late this month. I suggest using this occasion to come to grips with the problem and also establish a "marketing policy" which should be building [binding] for all MSFC personnel. If we don't do this, we might get into serious trouble. ✓

HHK — o.k. Request a draft jointly prepared between you and Lee James B

3. FISCAL 1965/66/67 SYSTEMS STUDIES: We have now completed our first 1964 edition of what we call our "Shopping List" for Advanced Systems Studies. It is a center-wide list. We use it as a basis for discussion with the Headquarter program offices and also within MSFC. Copies of this list have been distributed to the Laboratory Directors for comments.

In summary our "desirements" add up as follows:

FY 1965	52 studies:	$\$20.425 \times 10^6$
FY 1966	60 studies:	$\$22.8 \times 10^6$
FY 1967	57 studies:	$\$21.4 \times 10^6$

We probably cannot expect much more than 12 million dollars per year as Mr. Gray's budget totals only $\$26 \times 10^6$ per year. ✓

NOTES 3-9-64 KUERS

B 3/25

Eberhard K

Please look into this. Sounds bad B

1. Personnel: Since July last year ME Laboratory has lost twelve engineering personnel, grade GS-13 to GS-15, by transfer to Industrial Operations and Quality Laboratory. Major incentive for these request for transfer are offers and promises of higher pay grades. Very few of them are good people deserving a raise. At the same time requests for promotion of some of my own best people within my own organization are being disapproved for no apparent reason. This situation is very unhealthy and not to the benefit of our Marshall Center. The net result is promotion of and loading Industrial Operations with many marginal people and denying promotion to the deserving people.

2. Saturn V, S-IC Stage: The fuel test container has been delivered to P&VE. The next operation in the tower building will be the joining of the lower and upper halves of the fuel container of the T-vehicle. Welding tests for this operation have been started today at the assembly station of the tower.

3. Super Insulation Technology Program: The 70" diameter Super Insulation Test Tank is now ready for delivery to Test Laboratory for LH_2 testing. The outer flexible vacuum bag was sealed down to a leakage rate of below 10^{-3} ccm per second, which would be sufficient for about one week holding time on the launch pad without additional vacuum pumping. The sealing was accomplished through several weeks of tedious rework of the seams and at the penetration points of the bag. A trial shipment of the tank to Test Laboratory and back did not deteriorate the sealing level. A new improved bag design and manufacturing mode is in development and will be tried out on the same tank after it comes back from testing. The super insulation at this tank consist of alternate layers of glass and aluminum foil type Linde SI62 with a total of 140 layers.

NOTES 3-9-64 MAUS B 3/25

1. ELLIOTT COMMITTEE - Ray Kline has been advised by staff members of the Elliott Committee that Mr. Elliott was completely satisfied with the hearings at MSFC last week. We will deliver the transcript to you tomorrow for your review and mark up. We are to forward the transcript to Washington on Wednesday, March 11, 1964. ✓

2. MSF TOP LEVEL PLANNING NETWORK

   Dr. Mueller has, in a letter of February 26, asked MSFC to validate the integrated top level PERT network of the Manned Space Flight Program.

   The results of the validation, and questions and comments concerning the network are to be transmitted to MSF by March 16, 1964. ✓

3. MSF PROGRAM REVIEW MEETING - At the request of MSF, the MSFC presentations for the March Program Review Meeting will be limited to problem areas. Timing will be as follows:

Saturn I, IB	20 minutes
Saturn V	20 minutes
Engines	15 minutes ✓

   Institutional presentation will be omitted entirely. The curtailment is (Gorman) to enable discussion of other items being added to the agenda by Dr. Mueller. Two of the agenda items are:

   a. Discussion of the FY 64 funding situation, with consideration of pre-financing of FY 65 effort using FY 64 funds. ✓

   b. Processing of Procurement Documents - Dr. Mueller has named five contracts on which he asks us to identify the delays that have occurred in the procurement process. Clyde Bothmer is to make the presentation on this at the Program Review. Action at MSFC is assigned to Wilbur Davis. ✓

4. PROGRAM OBLIGATION PLANS - The next R&D Program Obligation Plan is due in MSF April 15, 1964. Guidelines have been received on lunar program and format. MSF promises guidelines shortly on:
   - -$41m sub-system backup development money
   - -SRT & ART sponsored by other program offices
   - -Administrative Operations
   - -Construction of Facilities
   - -More guidelines on format ✓

fw 3/9

NOTES 3-9-64 McCartney B 3/25

1. FY-66 CONSTRUCTION OF FACILITIES JUSTIFICATION: On March 2, my office received guidelines concerning the FY-66 Construction of Facilities budget from the Facilities & Design Office. The guidelines included a request to consider facility requirements for the Cryogenic Module and Saturn IB Third Stage programs. The laboratories are now preparing the required justifications and back-up data. A final R&D Operations review of all FY-66 CofF program requirements is scheduled for March 17.

2. R&D OPERATIONS CONTRACTOR ALLOCATION PLAN: The manpower planning and control system for support contractor effort within R&D Operations has been discussed with some laboratories, Mr. Andressen, and Dr. McCall. The plan is now in final stages of preparation and coordination and is expected to be released by mid-March.

3. YEAR-END UNENCUMBERED FUNDS STUDY: Financial Management Office is now issuing work orders based on adjustments resulting from the Saturn I, IB, and V unencumbered funds studies. All adjustments are expected to be included in the March 10 Program Authorization Plan.

4. STATUS OF SATURN "BLOCKED ACCOUNTS" FUNDS: As of March 6, unencumbered R&D funds placed in "blocked accounts" for the Saturn I total about $8-1/4M, for the Saturn IB about $5-1/2M, and for the Saturn V about $12M. These "blocked accounts" are focusing R&D attention on the size of the "obligation" job remaining to be done this fiscal year.

NOTES 3-9-64 MRAZEK

1. LOX PUMP EXPLOSION: On 2-20-64, a LOX pump explosion occurred on R&D engine 014. The pump had approximately 1,400 seconds of runtime, 1,300 seconds of which were for engine testing. The explosion occurred after 110 seconds of mainstage. The LOX discharge pressure rose sharply four milliseconds before the explosion. All other parameters appeared normal with the exception of a change of Direct Current trace 270 milliseconds observed on a radial accelerometer on the turbopump before the explosion.

Testing has been discontinued both at Edwards Air Force Base/Rocket Site and MSFC until definite conclusions are reached.

2. S-IVB CONTINUOUS VENTING: Douglas Aircraft Company's study confirms technical feasibility of a continuous venting system for the S-IVB and shows a potential payload gain of 1,900 pounds.

3. S-II PROCESS SPECIFICATIONS: Review of North American Aviation, Inc. (NAA) process specifications was held 3-3/6-64. All top priority NAA process specifications have either been reviewed or are scheduled for review. The next review meeting is scheduled for 3-17/18-64.

The conference method is very favorable when programmed far enough in advance to allow time for in-house reviews to be made and to adjust the laboratories' workload to accommodate the scheduled conferences.

4. NASA HAZARDS ADVISORY BOARD: (Reference NOTES 2-17-64 MRAZEK, paragraph 2.) We have obtained, unofficially, a draft copy of the charter of this proposed Board.

5. CRYOGENIC SPACE PROPULSION UNIT/SATURN V UPRATING: Saturn V launch vehicle data were prepared for Mr. L. Fero, Office of Manned Space Flight, to assist in evaluating a Cryogenic Space Propulsion Unit within the framework of an Apollo mission insurance program. Data included present performance, present weight savings programs, and payload exchange ratios for various parameters. Possible Saturn V improvement programs were presented, including larger stages with higher thrust engines, earth orbit rendezvous using Saturn IB and Saturn V launch vehicles, fluorine oxidizer stages, and the Cryogenic Space Propulsion Unit based on the Multi-Mission Module configuration. The Earth Orbital Rendezvous profile was requested by Mr. Fero. Facility limitations were discussed, and cost and schedule estimates of a possible improvement program were presented. KSC submitted separate cost and facility information as affected by the proposed configurations. Due to the limited time available for study, all numbers were qualified as preliminary estimates only.

6. PROPOSED LOX DEPLETION FOR SA-6: Aero-Astrodynamics Laboratory has recommended LOX depletion from S-I-7 or S-I-9 be installed in S-I-6. New fuel depletion sensors must be installed. Qualified sensors will not be available until 4-1-64. Resolution to the problem is expected within one week.

7. SA-201 INSTRUMENT UNIT MOCKUP PROGRAM: The environmental system design is 75% completed.

Attachment #1: Charter (Copy attached for Dr. von Braun only)
Attachment #2: NOTES 2-17-64 MRAZEK

10/29/63

DRAFT

TO: B
R
S

FROM: AAD-2

SUBJ: Establishment ~~of a~~ NASA Hazard ~~Program Evaluation and Coordination~~ Board

Hazard criteria are among the principal governing factors in the conception, design and operation of space vehicles, their component parts and related test and launch facilities. Furthermore, with the introduction of new propellants, vehicle configurations and operating techniques, hazard criteria must be under continuous study and revision to be kept current and clearly defined; such an effort requires a considerable expenditure of funds and effective use of technical manpower.

The attached proposed Management Instruction, developed by OMSF and the NASA Safety Officer, will establish a NASA Hazard Board, representing NASA Headquarters and all NASA Installations, to coordinate and evaluate NASA capabilities and efforts for determining hazards characteristics of materials, equipment, propellants and other space-related chemicals; to ensure that all hazard categories are being adequately researched; to prevent duplication of program efforts; to determine instances of inconsistent standards; and to facilitate ready exchange of information.

The establishment of this Board is recommended as the most efficient method for assuring development of hazard characteristics data that are consistent with NASA's current needs; for enabling NASA to effectively

DRAFT

Attachment #1

cooperate with other agencies in prevention of duplication of efforts in hazards evaluation studies; and for furnishing the Safety Office with information needed for its in-house and inter-agency efforts on development of uniform safety criteria.

Your concurrence and/or comment is requested on the attached NASA Form 443.

WEB

George E. Mueller
Deputy Associate Administrator
for Manned Space Flight

Encl: Proposed Management Instruction
NASA Form 443

REQUEST FOR ISSUANCE CLEARANCE

DATE

PART I—TO BE COMPLETED BY INITIATING OFFICE

TO:

Office of Administration

FROM:

Office of Manned Space Flight

Category (*Check one*)

- [X] NASA MANAGEMENT MANUAL
- [ ] NASA CIRCULAR
- [ ] NASA ANNOUNCEMENT
- [ ] NASA HANDBOOK
- [ ] OTHER (*Specify*)

Description of proposed issuance:

Establishment of a NASA Hazards Board comprised of representatives from Headquarters Offices and each of the Centers. The purpose of this Board is to coordinate hazard evaluation effort within, or funded by NASA to insure no important area of hazard investigation is overlooked, to insure that there is no duplication and to facilitate ready exchange of hazards information throughout NASA.

Application (*Check one or more*)

- [X] HEADQUARTERS
- [X] FIELD
- [ ] CONTRACTORS
- [ ] OTHER (*Specify*)

Distribution proposed:

NASA Management Manual at Headquarters and all Centers

For information contact:

1. George D. McCauley Code BY
2. Norman G. Peil Code MLO

Telephone

1. 13-21325
2. 128-7259

Clearance due:

November 15, 1963

OTHER REVIEWING OFFICES

Office of Space Sciences

Office of Advanced Research & Technology

BAM-1 (Information copy)

PART II—TO BE COMPLETED BY REVIEWING OFFICE

COMMENTS: (*Use additional sheet if necessary*)

- [ ] CONCURRENCE
- [ ] OBJECTIONS (*See above*)

Signature

DATE

PART III—FOR OFFICE OF ADMINISTRATION USE

Issuance Record

Approved by:

DATE

NASA Form 443 (Rev. Jun 63)

16—77286-1 GPO

DRAFT

10/2/63

PART I
MANAGEMENT MANUAL
GENERAL MANAGEMENT INSTRUCTIONS

CHAPTER

NUMBER

EFFECTIVE DATE

SUBJECT: NASA HAZARDS BOARD

1. PURPOSE

This Instruction establishes and defines the composition and functions of a NASA Hazards Board which will consolidate and guide all NASA efforts capable of yielding information on the hazards characteristics of materials, equipment, propellants, and other space-related chemicals, in order to ensure adequate research coverage, to avoid duplication and to provide timely information exchange.

2. APPLICABILITY

This Instruction applies to the existing and contemplated hazards efforts at all NASA Installations related to the following subjects:

Non-nuclear detonations and explosions (e.g. over-pressures, fireballs, and fragmentation)

Fire and heat

Acoustics

Toxicity

Nuclear radiation

Electromagnetic radiation

Light

Other environmental factors

3. FUNCTIONS

Within its area of responsibility, and with necessary and proper coordination, the NASA Hazards Board is responsible for accomplishing the following:

a. Prevention of duplication in hazard program activities.

b. Analyses to ascertain, if all hazard categories are being adequately research, and to recommend studies which will eliminate the deficiencies.

c. Improvement in communications between those persons working on NASA or joint programs and those concerned with using data obtained therefrom.

d. Coordination and evaluation, including prior budget review, of all current and future NASA in-house and contracted efforts planned for, or capable of determining hazard characteristics from which safety criteria can be developed.

e. Determination of current NASA in-house capability for conducting hazard testing and evaluation work.

f. Make recommendations to the NASA Safety Office for consideration for adoption as official NASA safety criteria.

g. Promotion of research information exchange.

4. COMPOSITION

The NASA Hazards Board (abbreviated in this Instruction as The Board) will comprise the following:

Co-Chairmen

A Headquarters OMSF Co-Chairman and Alternate.

A NASA Safety Office Co-Chairman and Alternate.

Members

A Member and Alternate from each of the following Headquarters Offices and Field Installations:

Headquarters

Office of Advanced Research and Technology

Office of Manned Space Flight

Office of Space Sciences

Safety Office

NASA Installations

Ames Research Center
Flight Research Center
G.C. Marshall Space Flight Center
Goddard Space Flight Center
Langley Research Center
Launch Operations Center
Lewis Research Center
Manned Spacecraft Center
Wallops Station
Western Operations Office

Consultants

Up to three consultants are allowed from each Headquarters Office and Center listed above under "Members."

Consultants, as used in this Instruction, are full-time NASA employees. Part-time or non-NASA individuals, regardless of function or professional status, are referred to as Invitees.

Invitees

When The Board or its Work Groups can significantly benefit from such attendance, other NASA or non-NASA individuals may be invited to participate in a meeting, providing the appropriate Chairmen or Co-Chairmen grant prior approval.

Representatives

This designation is given to all Members, their Alternates and Consultants, exclusive of Work Group Chairmen, who serve on Work Groups.

Work Groups

The following Work Groups are established and their membership will be appropriate to complete the assigned tasks:

- Work Group on Non-nuclear Detonation and Explosion Hazards
- Work Group on Fire Hazards
- Work Group on Acoustic Hazards
- Work Group on Toxic Hazards
- Work Group on Nuclear Radiation Hazards
- Work Group on Electromagnetic Radiation Hazards
- Work Group on Light Hazards
- Work Group on Other Environmental Hazards

5. SELECTION OF MEMBERSHIP

The Board

The Members and their Alternates will be designated, in writing, for a tenure of one year (reappointment permitted) by the respective Directors of the Centers and Headquarters offices. Selection will be based upon the candidates' technical comprehension of hazards' evaluation and awareness of project activities. The NASA Safety Office Member and Alternate will be designated in the same manner by the NASA Safety Officer. The Co-Chairmen and their Alternates will reside permanently in CMSF and the NASA Safety Office.

Note: The NASA Safety Officer will designate the person to serve as Co-Chairman and his Alternate.

Consultants

Consultants will be selected by Board Members.

Work Groups

Each Work Group will be chaired by a Board Member or Alternate/ designated by the Board Co-Chairmen, in writing, for a tenure of one year (reappointment permitted).

The membership of the Work Groups will be composed of Representatives selected from the list of Board Members, Alternates, and Consultants, by the Work Group Chairman.

No specific limitation is set on the total number of Representatives on a Work Group, nor on the number of such Representatives coming from a particular Center or Headquarters Office. However, the minimum number, consonant with thorough technical coverage and efficient operation, is recommended.

The Co-Chairmen and their Alternates, are Ex-Officio Representatives on all Work Groups.

6. VOTING

Each Center or Headquarters Office is limited to one vote on The Board and on each Work Group. Alternates are plenipotentiaries. The respective Center or Headquarters Office Director designates the voting representative and the ranking of Alternates, if more than two of his Representatives are on the same Work Group.

In the event of a tie vote in a Work Group or Board meeting, the respective Chairmen or Co-Chairmen may elect to vote or decline.

All action will be decided by a two-thirds majority vote of eligible voters present.

7. MEETINGS

Schedule

Regular meetings of The Board will be held at least semi-annually and special meetings may be called if, in the opinion of the Co-Chairmen, there is justification. (The initial meeting will be held in Washington, D.C.) The location of the next meeting will be decided by a vote before adjournment of each meeting.

Work Group meetings will be called by the Work Group Chairman subject to approval by The Board Co-Chairmen, and at times and places appropriate for accomplishing the assigned task.

Attendance

Attendance at all Board and Work Group meetings by the Members or Alternates and Representatives is compulsory, unless excused in writing by the respective Chairmen or Co-Chairmen. Both Members and Alternates may attend the same meetings. Subject to the approval of The Board Co-Chairmen, Consultants will attend The Board meetings when requested by a Member, when directed to do so by his Director, or upon the Consultant's own request.

Announcements

At least three weeks prior to the meeting, an announcement, containing date, time, location, security classification, and agenda for The Board meeting will be sent by The Board Co- Chairmen to all Members and Alternates, and for Work Group meetings, will be sent by the Work Group Chairman to all Members and all Representatives.

Minutes

The Chairmen will prepare, or have prepared, attendance lists and minutes of their respective meetings and will distribute copies as soon as practicable afterward to the meeting notice mailing/lists and to any other person(s) who attended the meeting.

The Board Co-Chairmen will appoint a permanent secretary who need not be from The Board or Work Group membership and who will record minutes of all Board meetings.

NOTES 3/9/64 RUDOLPH

We can fly'em on SatI any day !! B

1. Teague Hearing at S&ID - Received the following information from Mr. Neubert and Mr. Bowden (who sat through the total hearing). (a) Dr. Shea made the following general statement - the slippage in the launch vehicle schedule had allowed more time to look into the spacecraft development. (b) Daddario asked questions regarding S-II test stands at Santa Susana and MTO. Mr. Parker's reply was the same as you furnished the Committee here at Huntsville. (c) Teague said the spacecraft presentation was too cloudy to support the "supplement." (d) Parker of S&ID did not mention the need for a "supplement." Afterward Bowden and Freitag agreed to work up a justification and send it to Teague. (e) Freitag was questioned by the Committee concerning the article of Mr. Hies (Washington Times Correspondent) that there was a weight problem of approximately 3,500 lbs - supposedly learned from Houston.

2. Boeing Support Activity - In conformance with the Newby Committee Study conclusions and the R&DO implementation plan, six technical assistance orders are being implemented with Boeing. By July 1, 1964, it is planned to have negotiated contractual coverage in a single mission package with Boeing. ✓

Boeing personnel presented the results of their studies concerning Saturn V requirements in the area of configuration management. Specific consideration was given to the abbreviated requirements of an R&D space vehicle program (compared to weapons systems) and the procedures and documentation already in use by MSFC. The Boeing effort will be continued to provide a basis on which MSFC could propose a sound and useful configuration management system for the Saturn V. ✓

3. Hayes Engineering Support - Termination of Hayes International engineering support to Saturn V Project Office as of Mar 31, 64, has the following impacts: (a) Seriously affects our ability to comply with monthly SARP submissions to NASA Headquarters, and (b) Does not permit adequate time to convert interested contractor personnel to civil service status, resulting in a net loss of personnel available to the project. ✓

4. S-II Stage - S&ID will make a presentation to Seamans/Mueller on Wed, Mar 11, 1964, regarding S&ID's plan to build a small electronic component plant at McAllister, Oklahoma (near Tulsa), planned to employ 200 to 300 people (85 for S-II). Their justification is lower labor and overhead rates. Mr. Neubert is not in favor since it will mean another Splinter Group drawing on Government supervision in areas of quality control and contract administration. I contacted George Low to caution Dr. Mueller against making commitments on this subject in the Wed, Mar 11, 64, presentation. ✓

NOTES-3-9-64-SHEPHERD

ADDITIONAL AUTHORITY FOR REPAIRS AND ALTERATION: The MSF is to delegate, to Marshall, additional authorities in the Repairs and Alteration and Minor Construction programs as follows:

	Present Authority	New Authority
Minor New Construction	$50,000	$ 75,000
Repairs, Alterations & Maintenance	$50,000	$150,000

This new authority will require us to be very diligent in the execution of this work so as not to violate some of the rules, regulations and laws associated with this program or else we will be severely limited in the future. The Army has for several years been operating under very stringent restrictions as a result of violations.

HANCOCK COUNTY ROADS: As you have been told in the past by others, we have a rather ticklish situation in regard to the Hancock County Roads. The County Board Supervisors have closed the roads on one occasion and have threatened to do it at several other times. The Corps of Engineers first took the position that the County was not due any replacement of the roads in the Fee area which were taken over by the Government. The position now taken by the Corps of Engineers is that the County road system should be restored to the same utility as existed prior to the location of the Mississippi Test Facility in Hancock County. The Corps estimated cost for this is approximately $530,000. They are meeting today with the County Officials to further discuss this situation. A letter has been sent to Col. Raymond, District Engineer, stating in essence that this Center agrees with the position that the roads should be restored and requesting that the Corps of Engineers negotiate a firm road plan and cost with the County. This letter should forestall any immediate road closing by the County. Upon receipt of a reasonable plan from the Corps of Engineers, the necessary paper work will be processed to Washington and subsequently to the Congress notifying them of our intended actions.

B 3/25

NOTES 3-9-64 Stuhlinger

1. METEOROID WORKING GROUP PARTICIPATION: On February 26 Dr. R. D. Shelton attended a Meteoroid Working Group Meeting and discussed the results of recent calculations concerning meteoroid spatial distributions in the vicinity of the earth for various impinging patterns. Viewgraphs used in the talk were left with Mr. Warren Keller for a presentation by him to Dr. Seamans.

2. SRT PROGRAM STATUS: The status of the portion of the SRT program managed by RPL as of March 9 is as follows:

See separate memo from Ernst on this subject

	ANNUAL PLAN	AUTHORIZED	PROCESSED TO FMO	OBLIGATED
OART	10,209,000	10,209,000	6,254,000	1,296,000
OMSF	14,080,000	14,080,000	5,139,611	127,000
OSSA	675,000	675,000	381,193	17,265
	$24,964,000	$24,964,000	$11,774,804	$1,440,265

An additional 400K was received from NASA Headquarters on March 5 for application to the Space Vehicle System Program.

3. EXPERIMENTS ON SA-10: About 12 potential experimenters for SA-10 were contacted by RPL, and subsequently by Fairchild, and requested to prepare experiments for the payload. FSC and RPL will make a presentation concerning these experiments to OART on March 12. A final selection of experiments is expected following this presentation. The experimental program will be presented to Dr. Mueller's MSF Experimentation Board on March 25.

4. ADAPTER FOR SA-10: ME Laboratory began manufacturing one adapter for SA-10, consisting of two rings (from NAA) and the external cylindrical wall. This structure will be sent to FSC where the internal frame will be added. Two more adapters will be built in the same way.

5. FIFTH SYMPOSIUM ON THERMAL RADIATION OF SOLIDS: Seven members of RPL attended this symposium which was sponsored by NASA, NBS, and AF. Total attendance was 300 and for the first time international participation was secured. Mr. G. B. Heller was chairman of the session Space Environmental Effects on Thermal Control Surfaces. Several members of RPL gave papers. The attendees represent the scientific community in the area of thermal radiation problems. The symposium was on a high level and was very successful.

March 16, 1964

Bannon

NOTES TO MUELLER 3-17-64 DEBUS

1. CRAWLER ASSEMBLY: Plans for assembly of the crawler were presented to the Missile Sites Labor Relations Committee on March 9. This was to alert the union representatives, particularly the building trades representatives, that this was being done by crews of the Marion Power Shovel Company. Since it is considered a piece of equipment and not construction under Davis-Bacon, it is not necessary that building trades type workers be employed. The Millwrights representative registered opposition to this. For further clarification, the Labor Relations representative of Marion Power Shovel has been asked to come to the Cape and meet with representatives of the unions in an effort to avoid a jurisdictional dispute.

2. VAB STRUCTURAL STEEL: Approximately 2,150 tons of the 56,000 ton total of structural steel has been erected to a height of 70 feet in the east half of the low bay and the southern high bay areas. Steel erection in east section of low bay area is complete.

3. PROCUREMENT OF BASE OPERATIONS SUPPORT SERVICES: A Letter Contract was awarded to TWA on March 6, 1964, effective March 9.

4. ACTIVATION OF MSC FACILITIES FOR GEMINI: A meeting with MSC/POD and KSC was held to discuss the methods of contracting and schedules for GEMINI activation. Prior to the meeting, MSC had stated that activation of the Fluid Test Complex must be complete by mid-April and the O&C Building by mid-May, and indicated a desire to have this work done by Bechtel (cost plus) in order to meet these completion dates. However, during the course of the meeting, it was pointed out that certain portions of the work are susceptible to advertised fixed price contracts. Mr. Preston acknowledged the slippage in spacecraft schedules and agreed to advertise the work as proposed. The total estimated cost of activation is approximately $1,900,000. Approximately $1,200,000 of this sum can be fixed-price and will be done in this manner through our P&C and the Corps of Engineers, leaving approximately $550,000 to be done by Bechtel.

5. ENGINEERING SERVICES CONTRACTS: Due to the large number of proposals received (35), the evaluation is requiring more time than we had anticipated. Target date for completion of Board action is March 27, 1964.

6. LAUNCH SUPPORT SERVICES: Twenty-two proposals were opened February 5 and referred to the Source Evaluation Board. The committees are currently evaluating the proposals and expect to report to the Board on March 11.

7. ALTITUDE CHAMBERS, CONTRACT NAS10-732: The present plan at Headquarters is for OMSF to recommend that Mr. Webb approve limiting Phases 2 and 3 procurement to Stokes. This would reverse the present NASA position of recompeting those phases. MSC Florida Operations is now preparing a justification for non-competitive procurement and a revised work statement which would eliminate the solar simulator and make some other changes. MSC Headquarters has been asked by us if they will provide price assistance. If Mr. Webb approves the approach, a fixed price incentive contract will probably result.

8. GSA INTERAGENCY MOTOR POOL: GSA personnel are now officially established within this immediate area. Twenty-five GSA vehicles have been phased in and twenty-five more are expected to be delivered within the next week or ten days, all of which are to be utilized in lieu of Olin's rental vehicles.

9. FLORIDA EAST COAST RAILROAD: Operating unions succeeded in obtaining a restraining order from a Federal court in Jacksonville against FEC on effectuating new working rules. This has been noted as one of the first decisions against FEC. The FEC is appealing the decision. NLRB (National Labor Relations Board) proceeding on question of jurisdiction over picketing by railroad unions has not yet reached the Board.

10. LAND USE PLAN FOR MILA: The Jacksonville District Engineer, acting as our agent, will prepare a land use plan for the MILA. The purpose of this plan is twofold. First, it will document the many decisions already made concerning use of NASA-controlled land, and secondly, it will propose new uses of land areas not now committed to an economic use. The plan will be submitted to us in draft form so that it may be staffed thoroughly. Once approved the document will form the basis for KSC's land management program.

11. PROPELLANTS: Mr. Harwood was here to discuss standardization of specifications for high purity LOX and Hydrogen for fuel cell use. Side comments from Harwood were that the Air Force would like to transfer Plant 74 (West Palm) to NASA or surplus it due to the high operating costs and the fact that Air Force now has no Hydrogen requirements.

12. DIGITAL PROPELLANT LOADING CONTROL SYSTEM STUDY: is now underway. Five Bellcomm people are assisting. A first review is scheduled to be presented the week of 23 March.

13. HEATING PLANT: The heating plant went into 24-hour per day operation on March 9.

NOTES - BELEW 3-17-64

B 3/25

*Jw H-1 Engine Program

The first two production 200K engines are scheduled to complete acceptance testing March 13, 1964. Improved performance: preliminary information indicates that the budget and planning for an injector development program for improved performance will quote a total cost of approximately $2.0 million in addition to four GFP engines. The sixth 200K R&D engine is currently in test and contains a new production injector. This test series is being conducted to determine if bombing tests on an injector increases its susceptibility to self-induced instability during non-bombong tests. All instances of self-induced instability have occurred on injectors previously subjected to bombing tests. ✓

J-2 Engine Program

The 14 to 1 thrust chamber tests, mentioned in last week's report, have been delayed 2 weeks to allow additional R&D injector testing on thrust chamber stand VTS-1. Study is continuing on program to include the J-2 toroidal engine in the basic program. Current plans call for a presentation to you on April 14. ✓ Rocketdyne is implementing an active weight reduction program at our request. Detailed weight reduction proposals are expected by the end of March. The first battleship engine for DAC is scheduled for delivery on March 31. ✓

RL10 Engine Program

In response to your question on notes of 3-2-64, we have identified two acceptable RL10A-3 engines for allocation to Boeing for their company-sponsored test program. These engines will be available to Boeing in May. ✓

*Jw F-1 Engine Program

Engine F-1002 delivery date will be changed from March 25, 1964, to the third week in April in order to allow time for modification of the exhaust manifold expansion joints. This modification, which will also be effective on future delivery engines, is being incorporated to prevent or reduce cracking problems on the exhaust manifold assembly.

Relative to the recent turbopump explosion, engine system testing has been resumed with engine 018 on test stand 1A following inspection of all LOX pump impellers. Test stand position 1B-1 is now operative and engine 019 is being installed. Test stand position 1B-2 will be repaired by about March 23, 1964. The cause of the explosion is still being investigated. ✓

Engineering Services Contractor Conversion to Civil Service

As I have noted previously, the fact that we have received enough spaces to convert contractor personnel to Civil Service is not the problem. The problem lies in the length of time it takes to either hire incumbent contractors or to replace them from current Civil Service registers. We expect to be able to convert only three of our incumbent contractor personnel. The recent 1 month contractor extension will help, but we will be unable to fill the remaining spaces by May 1. ✓

NOTES 3-16-64 CLINE

1. S-IV-6 COMMON BULKHEAD: Eight doublers were bonded to the LOX side of the common bulkhead. Inspection revealed debonded areas in five of the seven doublers applied. Debonded areas varied from approximately .75-inch diameter to a maximum of 3½-inch by 1½-inch rectangular pattern. The decision was made to replace all the doublers. Replacement doublers are being fusion welded rather than bonded.

2. MSFC ENGINEERING STANDARDS MANUAL: The Chrysler Corporation has been issued a specific task assignment to "publish, maintain, and distribute the MSFC Engineering Standards Manual" to include preparation and mailing of revisions to all holders, packaging and mailing of manuals, and the maintenance of records and files as required. This work has previously been done in-house.

3. SA-6 PAYLOAD: A request to remove 1,600 pounds from Boilerplate 13 for SA-6 was sent to MSC 3-11-64. Official impact has not yet been received. MSFC is reviewing the 1,600-pound figure to determine its correctness in view of the other added weights. At the meeting on 3-12-64, it was agreed that the weight should come out of the Command Module with attendant slippage of approximately three weeks.

NOTES 3/16/64 CONSTAN

1. SUPPORT SERVICES CONTRACT MASON-RUST

The Metal Trades Council and The Mason Rust Company have reached an agreement for a union contract. The three year contract will be executed on March 17, 1964. The contract has been reviewed by Mr. Paul Styles.

CONFIDENTIAL

NOTES 3-16-64 DANNENBERG

1. Flight Missions - Flight mission assignments were further refined in Washington in the absence of MSC (plane trouble). Our proposals regarding "payload requirements" definition for each type of mission were accepted. Preliminary figures for IB are: reentry lob shot, 201 = 36,000 lbs; orbital reentry shot, 202 = 32,000 lbs; long duration missions = 32,500 lbs; CM/SM LEM operations = 33,500 lbs.

Under "Flight Objectives," orbital checkout was added. Exchange of "programmer" for manned vs unmanned flights was said to take from 60 to 90 days.

It was brought out that present discrepancy between launch schedules and spacecraft hardware availability (LEM production and preparation rates) has to be removed once missions are assigned.

We proposed requirement for Center Directors to sign off on Mission Assignments Document. Tommy Thompson will give mission run-down at next Management Council meeting. We will try to give you last minute briefing on revised document.

For continuing effort on flight mission details after mission assignment, Bellcomm is looking for identification of Center contacts.

2. SA-6 Payload Capability (Confidential) - SA-6 weight growth has resulted in a reduction of payload capability from 18,600 lbs. to 17,000 lbs. requiring removal of 1,600 lbs. of ballast from spacecraft or similar fix on L/V.

MSC indicates that spacecraft ballast can be removed only from C/M because of similarity requirements to dynamic tests. MSC has to do some ballast removal anyway since it discovered last week discrepancies between ballast distribution on flight payload and dynamic test article. Even after complete removal of ballast from C/M, SA-6 is still 150 lbs. shy of orbital payload capability. R&D is investigating possible modifications to the first stage (cutoff delay, reductions in helium heater backup system). Impact of launch delays from payload and/or L/V modifications are presently being assessed. Joint Center position to be reached today, hopefully.

GROUP 4
Downgraded at 3 year intervals;
declassified after 12 years

CONFIDENTIAL

NOTES 3/16/64 FORTUNE

B 3/25

1. Hancock County Board of Supervisors:

(a) Extended present contract for Security Patrol another year for $66,000. During twelve months ending 31 March the Patrol drove in excess of 200,000 miles, prevented fires, vandalism, at least one racial incident, and greatly aided local relations. New contract calls for 133,000 miles, since we're retrenching some from the Buffer Zone. Firebugs have started burning last year's brush and grass growth.

(b) Accepted Corps of Engineers offer of $410,000 for the county roads, agreeing not to blockade for 60 days to permit necessary reprogramming of funds, progress payments for actual road construction, etc. Ed Guilian and Wayne Dykes flew necessary correspondence to Washington Friday to expedite Headquarters handling.

2. Corps of Engineers: is preparing to take over maintenance of Upper and Lower Gainesville roads that are travelled by their heavy concrete trucks . General Electric finally got these roads in passable shape and the construction contractors theirs; with reasonably good weather no further construction delays due to muddy roads should be experienced.

for 3/16

B 3/25

NOTES 3/16/64 GEISSLER

1. SA-5 Flight Results: Re: your comments on item 1 Notes Geissler 3/2/64, copy attached. (a) Present status on evaluation of disturbance moment in roll appears to exclude fin misalignment as primary cause. Wind tunnel tests with fins attached, but no misalignment, yielded approximately twice the moment observed on SA-5. Additional wind tunnel tests are planned in the near future to identify the source of this roll moment. The magnitude is non-critical for future flights. (b) Continued studies on the failure mechanism of the interstage panel which debonded after separation have failed to give conclusive results. There are no pertinent data available besides onboard films. ✓

2. Proposed SA-6 Changes: (Re: Notes Geissler 3/2/64) Replacing the SA-6 cutoff probes in the S-I LOX tanks by shorter probes would require an additional timer and network changes. Therefore it was decided to fly SA-6 with present probes and remove a larger amount of ballast from the CM (1,600 lb instead of 800 lb). MSC has advised that any removal of ballast may cause delay of up to 3 weeks. However, there is no way to fly SA-6 in its present configuration without such removal independent of the proposed changes (closed loop guidance; angle of attack bias). ✓

3. NASA Hazards Board: Re: Dr. Mrazek's Notes of 2/17/64 and 3/9/64, copies attached. If this "NASA Hazards Board" is established, Aero-Astrodynamics Laboratory would be intimately concerned, since the proposed purpose of the board is "to consolidate and guide all NASA efforts capable of yielding information on the hazards characteristics of materials, equipment, propellants, and other space related chemicals, in order to insure adequate research, to avoid duplication, and to provide timely information exchange." Since we are concerned with the natural environment associated hazards, we request membership in the following working groups of the NASA Hazards Board: (a) Working Group on Nuclear Radiation Hazards and Working Group on Toxic Hazards - Mr. John Kaufman; (b) Working Group on Acoustics Hazards - Mr. Orvel Smith. P&VE has shown us a copy of the proposed charter and we have no major objections to the charter as it stands, assuming we have adequate membership in the working groups outlined above as well as a member or alternate member on the board. We have no strong feelings, however, as to who should be the major MSFC board member.

Fred Cline P&VE

ffi

B

4. S-IV B Vehicle Dynamics and Control Working Group Meeting: Action items which resulted from the fourth meeting of the S-IV B VD&CWG, held on Feb. 26, and 27, 1964 are attached. ✓

NOTES 3-16-64 GRAU

1. S-I-7 POST-STATIC CHECKOUT: Post-static instrumentation checkout and pressure and functional testing of the S-I-7 stage is in progress in the pressure test cell of building 4705. Distributors are being removed from this stage for soldering inspection.

2. S-IU-7 CHECKOUT: Instrumentation checkout of the S-IU-7 Instrument Unit is in process. Network Functional Test will be rerun due to removal of distributors for reinspection. This removal, as well as the removal of the distributors from S-I-7, was a result of conditions found at KSC in the distributors for the S-I and IU stages of SA-6. An estimate of one week has been made to perform rework and incorporate two Engineering Orders. No resolution has been made as to the possibility of delaying the S-IU-7 schedule to allow complete systems checkout using flight components.

3. S-IV-9 POST-MANUFACTURING CHECKOUT AT DAC, SANTA MONICA: Post-manufacturing checkout of the S-IV-9 stage is on schedule, although completion of propulsion and instrumentation subsystems has been delayed by part shortages.

4. S-IC RELIABILITY PROGRAM SURVEY: A survey using NASA SP-6002 Reliability Program Evaluation Procedures has been conducted at Boeing, Michoud. The survey, combined with a previous analysis, led this Laboratory to request that Boeing be directed to revise their Reliability Plan for incorporation as a contractual document.

5. S-1C TEST AND CHECKOUT STATION DESIGN REVIEW: The Phase III Design Review has been completed and Astrionics Laboratory is currently consolidating MSFC comments. The review indicates that there is a rather high number of mistakes in the documentation, and discussions developed concerning the possibility of disapproving the Phase III submittal due to this situation. It was decided, however, to give approval pending clean-up of the drawings. Close followup will be maintained to assure corrections are made.

6. S-IVB PROGRAM: Coordination meetings with DAC on the first draft of the S-IVB Reliability Program Plan were completed March 5, 1964. The second draft should arrive at MSFC for final coordination April 14-16, 1964. The S-IVB Traceability Plan as defined in Scope Change 112 and the document "Establishment and Maintenance of Identification" has been approved by this Laboratory. The plan will satisfy overall requirements of the Traceability Program if it is properly implemented. Therefore, it was requested that DAC be directed to forward to this Laboratory all internal procedure documents defining implementation. A detailed justification and the criteria for a S-IVB Checkout Building at SACTO has been submitted to Industrial Operations. The plan would divert funds originally budgeted for a third static test stand at SACTO to the building. This matter has been discussed with stage manager and facility engineering personnel, and Industrial Operations is in general agreement with the plan.

NOTES 3-16-64 GRUENE

1. SA-6 Spacecraft: It is not known at this date what effect the shifting of ballast in the spacecraft will have on the firing schedule.

2. S-IV-6 Status: The welding on the common bulkhead is complete. Dye penetrant and leak checks of the common bulkhead have been satisfactorily completed and present plans are to erect the S-IV-6 on March 19, 1964.

FW 3/16

NOTES 3/16/64 HAEUSSERMANN B 3/25

1. ST-124 FOR SA-7: ST-124 S/N 004, assigned to SA-7, is undergoing slip ring retrofit at EP-Bendix. Due to delays in vendor delivery of slip ring capsules, EP will not be able to deliver before 4/15/64 and may run as late as 5/15/64. We will need approximately five weeks in Astrionics for certification and calibration. In the meantime, a "Shop Queen" platform will serve to checkout SA-7. The final flight platform S/N 004, after laboratory checkout, will be shipped directly to KSC for installation in SA-7. ✓

2. STATUS REPORT - DYNAMIC AND CONTROL WORKING GROUP: Status of last meeting is summarized in attachment.*

PLEASE KEEP NOTES TO 1 PAGE
Such items as attached sheet on reports can be submitted ~~separately~~ separate of NOTES.

FW 3/16

*1 Enc:
a/s

STATUS REPORT - DYNAMIC AND CONTROL WORKING GROUP B3/25

Meetings were held during the week of 2/24 on the S-II and S-IVB stages at the contractor's plants.

a. S-II

Second plane separation in the presence of an engine-out condition was discussed. The unsymmetrical flow pattern tends to force the interstage to collide with malfunctioned engine. The situation is aggravated by the deflection of the remaining control engines required to produce a balance of control torques. Wind tunnel tests at Langley have shown that by limiting the deflection of the control engines to 2.5° in each plane during second plane separation, a clearance of 10 inches can be maintained. A deflection of 2.8° in each plane is needed to compensate for thrust misalignments and the unbalanced torque caused by the malfunctioned engine. However, a limitation to 2.5° for a short period of time (2 to 4 seconds) does not cause loss of control.

In light of the conservatism of the S&ID studies, no definite decision has been made to limit the control deflection. If further studies show the deflection limitation to be required, implementation can be provided within the instrument unit.

b. S-IVB

EARTH ORBIT: Automatic cyclic venting of the fuel tank occurs a maximum of 15 times during 3 orbits. Likewise, 3 vents of the LOX tank will occur. The impulse from these vents will interfere with navigational sightings to be performed by the spacecraft crew. Even though provisions will be made to allow the crew to force a vent prior to the initiation of a sighting, utilization of the forced vent will be avoided, if possible, to conserve propellant. Statistical studies show that by scheduling 7 or 8 sightings per orbit, at least the 6 desired sightings can be obtained free of a venting disturbance. Preliminary discussions with MIT and MSC indicate that if the continuous venting scheme is implemented, the resulting disturbances would not interfere with navigational sightings.

LUNAR TRAJECTORY: Venting after lunar injection poses two problems:

(1) A vent during the ~~transportation~~ CSM turnaround and docking in transit may adversely affect this maneuver.

(2) The velocity imparted by the vents cannot be accurately predetermined; it may be as high as 4 m/s. This reflects adversely on the guidance accuracy.

Venting of the propellant tanks cannot be delayed until after the transposition and docking maneuver. Prevention of a disturbance during ~~transportation~~ transposition and docking can be accomplished by a blowdown of both tanks prior to the initiation of the maneuver. The ulterior effect of post injection venting on the guidance accuracy is not yet resolved.

FW 3/16

B3/25

NOTES 3/16/64 HEIMBURG

*FW 1. F-1 ENGINE TESTING (STATIC TEST TOWER WEST): Due to the present plans for an F-1 engine test on 3/25, the lox impeller for engine F-1001 was returned from Rocketdyne, Canoga Park. A new lox pump seal (the old seal appeared to be approaching failure) has been installed, and the lox pump has been reassembled. The lox dome and injector were removed from the engine, inspected, and reassembled. The turbine has been assembled, and the engine will be installed in the test stand today, 3/16. A shake-down firing is scheduled for 3/20. ✓

KH !! Where did the parts come from?

Inspection of the lox pump during disassembly found a 10-32 bolt and washer in the lox dome. This hardware is a part of the Rocketdyne suction ducting. It is assumed that the impeller damage ((discussed in the 3/9/64 Notes--copy attached)) was caused by the passage of the bolt and washer through the pump. It was also noted that the turbine blades had minor erosion only, with several cracks perpendicular to the blades. ✓ omit in FWB

*FWB 2. S-1-9 (SA-18): A 35-second mainstage firing of the S-1-9 stage was successfully performed on 3/13. This was the initial test performed entirely by Chrysler personnel. Preliminary evaluation of data indicates that all systems performed satisfactorily. Data evaluation and hardware inspection are presently underway.

The initial attempt to fire S-1-9 on 3/12 had to be scrubbed. During the final countdown, while lox tank pressurization was in progress, cutoff was inadvertently given by a redline observer. The command to reset was given; however, the panel operator pushed the console cutoff button instead of the reset button, which resulted in firing of the Conax valves. The necessary rework required three hours, by which time the test had to be cancelled due to adverse weather conditions. ✓

3. S-IC-T Working Group: Reference NOTES 3/2/64 KUERS (copy attached). Regarding your question to me as to the necessity of ring baffles in the S-IC-T vehicle, after discussion with Mr. Hellebrand, P&VE Lab, we have come to the following conclusion. Although the sloshing problem does not exist in S-IC-T, we feel that it is imperative that the structural integrity of the slosh baffle be investigated under the flow conditions which occur during filling and emptying. ✓ You recall that during the early Jupiter tests, the slosh baffles were distorted during the filling operation, and modification of these baffles was required for the flight vehicle. ✓ If the S-IC-T vehicle was being delayed only due to the fabrication of the ring baffles, we would say that they could be deleted. However, as you well know, there are a host of items which very well may cause a much greater delay than will the ring baffles. ✓

4. MTF Working Group: The proposed MSFC contract with Air Products and Chemicals, Incorporated (APCI) for the liquid hydrogen plant for MTF was approved by NASA Headquarters on 3/11. ✓

ATTACHMENT 1: NOTES 3/9/64 HEIMBURG (copy to Dr. von Braun only).
ATTACHMENT 2: NOTES 3/2/64 KUERS (copy to Dr. von Braun only).

Tue 3/16

B 3/25

NOTES 3-16-64 HOELZER

LARGER COMPUTER FOR FINANCIAL MANAGEMENT OFFICE:

Financial Management Office has requested a larger computer. The Projects and Industry Applications Division does not agree that a larger machine is warranted from an economical standpoint nor from a Data Center equipment utilization standpoint. This disagreement will probably require considerable study before finally being resolved. ✓

B 3/20

NOTES 3-16-64 JAMES

Reference Kuers 3-9-64 Notes, Saturn I/IB Project Office has obtained four personnel from ME Laboratory during the period mentioned in the reference. Three were GS-14's and one was a GS-15. None of these persons were promised or have been given promotions since transfer. !! B All have turned in good performance. I would be completely receptive to discussing with Mr. Kuers the transfer of some of his "non-marginal and deserving" personnel for the overall benefit of the MSFC Saturn Projects.

Leed. Please do! B

SATURN I - S-IV-6 - The original bonding for the common bulkhead left some "void" places in 5 of the patches. A decision was made to weld the patches instead of rebonding. Welding was completed Saturday night, the bulkhead tested and no indication of leaks were present. The best estimate of the schedule is erection of S-IV-6 on Thursday morning, March 19. Overall vehicle schedule will be assessed today and possibly determine a target launch date. This will not change launch date.

S-IV-7 - On Friday, March 13, it was decided not to perform additional propellant loading tests on S-IV-7, (as reported in my notes last week.) We are still trying to hold S-IV-7 delivery to the Cape to about June 3, based on SA-6 launch. Slippage of SA-7 would delay remaining Saturn I's.

LES for SA-9 and 8 - Tommy Thompson of Headquarters has informed me that he will present this problem to Dr. Mueller for decision as follows: MSC can furnish the LES towers and MSFC needs the towers on these two flights and he will recommend that Dr. Mueller approve the LES for these two flights.

SA-6 Payload Weight - SA-6 weight at S-IV cut-off is 1,600 lbs. heavy for circular injection. The Flight Mechanics Panel agreed that ballast could be removed from the spacecraft. However, a delay in launch would probably result. Other alternate solutions are being studied; such as, lowering S-I propellant cut-off sensors, reduction in number of helium sphere for helium heater back-up on S-IV stage and performance increases. Decision will be made this week.

SATURN IB - Saturn IB Performance - Reference my notes 2-17-64 and your comment as to my "breezy optimism" about the future performance of the Saturn IB. At the time, I was optimistic because it seemed to me the gloomy feeling of everyone as to the performance of Saturn IB, together with MSC's attitude, could cause it to go the way of Saturn I. We have enough improvements in sight to take the present performance to 37,000 lbs. However, I have lost my optimism because we are losing 400 lbs. a month. At this rate, we will be down nearly 10,000 lbs. in two years. This is caused by our changes (such as a 110% bending moment increase) and by bad estimates. This trend must be stopped and I intend to impact weight as well as cost with every change proposal.

Fred Cline
Emil Hellebrand
(P&VE) f. info. THIS IS SERIOUS.
B 3/20

NOTES 3-16-64 Koelle

1. NASA POLICY COUNCIL: As you know, the NASA policy council under Dr. Thompson has been concerned lately with the question of reusable space vehicles, in general, and the need for a hypersonic research airplane, in particular. I talked to Marvin Schuldenfrei last Friday and he indicated that the council is favorably impressed by the arguments made for reusable space vehicles and will recommend more aggressive research in this direction. We will assist in writing the report, spelling out detailed recommendations. The council also found that there is very little enthusiasm for the hypersonic research airplane. NASA probably will not support such a project which would require in the neighborhood of one billion dollars.

2. CRYOGENIC PROPULSION UNIT: Mr. Fero was here last week to discuss in detail our plans for SATURN IB and V improvement studies. He mentioned that a recommendation will go to Dr. Mueller this week to allocate $500,000 of this fiscal year's study money for a program definition of the cryogenic propulsion unit. Dr. Mueller is quoted as being in favor of initiating development of such a unit in FY 1966, as a new start, with about $5,000,000.

NOTES 3-16-64 KUERS B 3/25

Saturn I, S-I Stage: The problem of manufacturing of electrical components to MSFC specifications which has caused a serious controversy between MSFC and the Prime Contractors at the West Coast has now also become evident here at Marshall. Distributor boxes manufactured by ME Laboratory for the Instrument Unit of SA-6 and SA-7 have been reinspected, rejected, and shipped back to MSFC. An evaluation of this case revealed the following:

a. It is correct without doubt that the workmanship is not according to existing specifications.

b. It is evident that the specification for electrical work, MSFC-158B is not practicable and cannot be used by any manufacturer for production of electrical hardware. This specification deals mostly with appearances and not with true quality parameters. DAC and NAA call this the "cosmetics" problem. The majority of the defects of the subject distributor boxes are now being waived.

c. I admit that some of the defects of these boxes do not reflect the best workmanship possible. From my analysis of the causes of these defects, I found that I have not received a single defect report on electrical work for the last year. Since it cannot be that we are 100% perfect in our work I conclude that the "in-process" inspection set-up in our electrical shop is not functioning properly. I have therefore given instructions to my supervisors to review the work first before submittance to inspection. This means shifting the responsibility for quality workmanship back from in-process inspection to the management of manufacturing where it belongs.

d. A contributing factor to the creation of many of the "appearance" defects has been the excessive modification work that has been carried out on these distributor boxes (176 pages of EO's).

We are making a great mistake in my opinion if we believe that the quality of workmanship at the prime contractors, as well as in-house, can be "managed" or controlled by specifications written by personnel without sufficient practical experience. We have manufactured distributor boxes and cable harnesses of the highest quality for more than 12 years without having these specifications.

FW 3/16

B 3/26

NOTES 3-16-64 MAUS

1. MSF TOP LEVEL PLANNING NETWORK - We expect to meet the deadline of today, March 16, which was set by Dr. Mueller for validation of the manned space flight top level network. The primary purpose of the validation effort is to facilitate establishment of an integrated scheduling system for the Manned Space Flight Program. Dr. Mueller, in his letter of February 26, established a target date of July 1964 for a conversion from the manual to an automated scheduling system. Tom Smith has developed an overall plan for accomplishing this and is coordinating the plan with IO and Computation Laboratory. ✓

2. APOLLO MASTER MANAGEMENT PLAN - Jack Phillips of NASA Headquarters is tentatively scheduled to meet with Tom Smith of this office and John Stone, I-RM, on March 25. This initial meeting is planned to be an orientation planning meeting, according to Mr. Phillips. ✓

3. FREITAG, LILLY AND BOTHMER VISIT - We have been notified that this visit has been rescheduled for Tuesday, March 31, 1964. It is still planned that the functions of the directorate of MC, MP, and MS be covered. In addition, Mr. Risso and Mr. Vecchietti will review the new procurement procedure. Ray Kline has action on this. ✓

4. CENTER DEVELOPMENT PLANNING - Prior to Dr. Rees' departure, he discussed a proposed meeting on Center Development Planning with Captain Freitag and Stan Smolensky. Total action on this matter has been assigned to the Executive Staff. The meeting has now been tentatively scheduled for April 27, 9 to 11 a.m. ✓

NOTES 3-16-64 McCartney

B 3/26

1. REPLACING OBSOLETE CAPITAL EQUIPMENT:

a. (Refer to my 3-2-64 Notes attached.) Last week, Mr. Foxworthy's office evaluated the annual equipment placement rating for the ME cherry-picker and determined that the equipment warranted replacement. ME Laboratory has requested procurement of a vehicle that is heavier and more versatile than the present cherry-picker. A procurement request will be forwarded today to Technical Services. The $36,000 cost will be funded from unencumbered Saturn V funds.

b. My Programs and Contracts Group has initiated action to secure $100,000 for Research Project's SRT replacement equipment requirements. Funds will be drawn from Saturn IB "blocked accounts."

2. CRITERIA FOR MANPOWER CONTROL: The planning and control system for manpower management is now being drafted. The system will use criteria for control of contractor manpower which categorize and clearly define contractor support. Mr. Zbinden of my office has developed these criteria, in cooperation with Dr. McCall, and is now coordinating them with Mr. Gorman and Mr. Maus.

3. STATUS OF SATURN "BLOCKED ACCOUNTS": As of March 13, unencumbered R&D funds placed in "blocked accounts" for Saturn I total about $8M, for Saturn IB about $6M, and for the Saturn V about $11-1/2M. We are now working with the laboratories and Industrial Operations to issue procurement requests for these funds by April 15. That cut-off date should help the June 30 obligation picture for Marshall.

4. VISIT OF MR. NORM CRONE: On March 11-12, Mr. Norm Crone (Mr. Lilly's office) visited Mr. Read, Chief of my Facilities & Equipment Group, to discuss R&D Operations facilities utilization and capabilities. Mr. Crone indicated that NASA Headquarters wishes to keep closely informed about our capabilities and our needs for facilities to round out these capabilities. We will keep in touch with them. Shepherd and Dykes will be fully informed.

5. RESOURCES MANAGEMENT CONFERENCE: The third regular meeting of the Resources Managers' Conference is scheduled for March 17.

NOTES 3/16/64 RUDOLPH

B 3/26

1. Configuration Management - Mr. Goldston represented Saturn V Project Office at a meeting at NASA Headquarters on Friday, Mar 13, concerning a new NASA Configuration Management Manual. A draft manual (a minor re-write of Air Force Systems Command Manual 375-1) has been prepared by General Phillips' people and a requirement has been placed on MSFC to review this draft and reconvene at NASA Headquarters next Monday, Mar 23, for final discussions prior to publication of the manual. Adoption will require a major realignment of MSFC technical management policies and procedures. Additionally, a major realignment of MSFC and contractor documentation will be required.

EX-DIR Action-Item

This should be staffed by EX - for the CENTER

2. Saturn V APS System - Plans are underway for a presentation on Mar 18 to Dr. Mueller on the Saturn V APS System. The presentation will cover results of recent studies of continuous venting, APS redesign, and common engine requirements.

3. S-IC-T Status - Fuel Tank continues to be six weeks in delay. The ring baffles have been installed in the upper bulkhead and are currently being installed in the lower bulkhead. LOX Tank continues to be five weeks in delay. Meridian welding of the lower bulkhead assembly is nearing completion and skin segment quadrants are being welded into skin segments. Thrust Structure continues to be three weeks in delay. The intermediate ring sections are being installed. The Intertank Section delay is now reported four weeks, an increase of two weeks. This is based on the latest MSFC on-dock date reported by Michoud. The Forward Skirt delay is now reported four weeks, an increase of two weeks. This is based on the latest MSFC on-dock date reported by Michoud.

4. Status of S-II Stage Assembly and Checkout Facility at Seal Beach - $.2M "advance design" facility funds received from NASA Headquarters and transferred to Navy Bureau of Yards and Docks for A-E design of facility. $1.0M is available in FY64 R&D S-II facility funds and is subject of MSFC reprogram requests dated Feb 5 and Feb 25, 64. These funds are required to start construction July 1, 64. $1.6M is included in FY65 budget for the facility and is required by Nov 1, 64, for completion of construction. A letter requesting 5.19 acres of land required for this facility is expected to be released the week of Mar 16, 64, from Dr. Seaman's office to the Navy.

5. I.U. Integration and Checkout - A draft of the I.U. Systems Integration & Checkout Procurement Plan amendment was forwarded to NASA Headquarters on Mar 16, 64. MSFC representatives will meet with NASA Headquarters' personnel on Mar 17 to discuss comments. Contract NAS8-5469 with IBM for I.U. Integration and Checkout has been signed by General Phillips and is now awaiting Dr. Mueller's signature.

6. Saturn V GSE Review - Plans have been established for a status review of Saturn V Vehicle GSE on April 15, 1964.

NOTES 3-16-64 - SHEPHERD

B 3/25

Correction of NOTES-3-2-64-SHEPHERD: (Copy attached) Paragraph entitled "Advance Design - FY-64" contained a typographical error, this paragraph should read: We have requested Advanced Design Funds on 18 FY-65 CofF projects totaling $4.046M. As of today, we have received all of this amount. It is quite urgent that we prepare criteria, select architects, and begin our design of the FY-65 program. In addition, $1.3M has been requested for FY-66 and subsequent fiscal years. To date we have not received any approvals against this request.

Hancock County Roads in Mississippi: Representatives of MSFC, Mobile District Engineers and Office, Chief of Engineers met with Mr. Lilly's office on March 14, 1964, and recommended that Hancock County be reimbursed approximately $410,000 for County roads within the Fee Area of the Mississippi Test Facility.

NOTES 3-16-64 Stuhlinger

1. SA-10 PAYLOAD: A final decision has not been made by OART on the SA-10 payload. However, it appears certain that our proposed payload with 12 experiments will not be flown. A decision is expected sometime this week; we will keep you informed.

2. ALSS SCIENTIFIC INSTRUMENTATION: Based on an invitation from Major Tom Evans, Mr. Downey visited MSC to attend the mid-term review of Texas Instrument's (TI) contract, "Study to Determine Optimum Measurements, Experiments, and Geologic Studies to be made on the Lunar Surface," funding level $194,000. TI's presentation dealt largely with the approach and organization of the study effort. Some technical details indicated that the work closely parallels the in-house studies being conducted by RPL in connection with the ALSS scientific instrument plan. It had been our understanding that the TI study concerned only early lunar surface Apollo missions with LEM/Truck Payload (ALSS) support. However, TI has considered some rather sophisticated experiments, eg. active seismic investigations, drilling, etc. RPL will stay in contact with MSC because of the direct relation of the TI investigation to the MSFC ALSS and LESA studies.

3. STATUS OF SRT PROGRAM: OMSF has increased our Program Authority from $14.080 to $14.133 and revised the Annual Plan to $14.163 million dollars. The status of the portion of the SRT program managed by RPL as of March 16 is as follows:

	ANNUAL PLAN	AUTHORIZED	PROCESSED TO FMO	OBLIGATED
OART	10,209,000	10,209,000	6,725,000	1,366,000
OMSF	14,163,000	14,133,000	6,172,000	182,000
OSSA	675,000	675,000	456,193	17,265
	25,047,000	25,017,000	13,353,193	1,565,265

March 23, 1964

fw 3/23

NOTES 3-23-64 BELEW

B 3/27

J-2 ENGINE PROGRAM

Rocketdyne made a presentation on their toroidal engine experience relative to developing a J-2 toroidal engine as a part of the basic J-2 program to cognizant MSFC organizational segments on Friday, March 20. A presentation to you is currently planned for April 14. Two 10 second tests with a 14 to 1 expansion ratio thrust chamber have been made on the thrust chamber test stand with encouraging results: i.e., no side loads, no combustion instability, no tube erosion. A preliminary 14 to 1 chamber program proposal is expected within two weeks.

→ 2pm B

RL10 ENGINE PROGRAM

Launch date for Centaur vehicle AC-3 is now scheduled for early April, 1964.

Centaur Project Management has expressed an interest in uprating I_{sp} of the RL10 engine by decreasing the throat area resulting in a higher expansion ratio in the same envelope. This will involve operating the engine at 400 psia chamber pressure (we have already had several firings in "limits" tests of 450 psia). Payoff is a 150 pound payload increase. Also fine for 3rd stage SatIB B

F-1 ENGINE PROGRAM

Test stand 1A at Rocket Engine Test Site, EAFB, has sustained continuing erosion and undercutting of the rock in the vicinity of the flame deflector in spite of recent gunite repairs. In order to alleviate the erosion, it is currently planned to modify the lip of the flame deflector with an additional five degree turn upwards. This modification which must start by May 1, 1964, will require about 4 to 6 weeks stand down time and may cost about $250,000. The degree of program impact will be determined by the readiness of new test stand 1-D which will be undergoing checkout and activation during the next few weeks. Test stand 1-A historically has handled 40 percent of the F-1 engine system tests, and its loss for several weeks could cause FRT schedule impact.

NOTES 3-20-64 CLINE

1. LH_2 CHILLDOWN DUCTS -SA-6: The SA-5 flight evaluation indicated that thermal protection might be required for the chilldown ducts. Based on a detailed thermal analysis, it has been determined that the addition of Thermo-Lag is not required.

2. SATURN/APOLLO MECHANICAL INTEGRATION PANEL (SAMIP) MEETING: The seventh SAMIP meeting, held on 3-17-64, solved SA-6, Boilerplate 13 ballast removal problem with no schedule impact. Also obtained was an agreement that the spacecraft adapter preliminary structural layouts will be provided to MSFC by 4-7-64. These are needed to build the adapter to test the Instrument Unit.

3. S-IVB/INSTRUMENT UNIT/SPACECRAFT VENTING: SAMIP Ad Hoc Group on S-IVB/Instrument Unit/Spacecraft Compartment Venting met on 3-18-64, and agreed on a concept so that design can proceed. The difference between MSFC's and MSC/North American Aviation's (NAA) discharge coefficients is to be checked, and another meeting will be held on 4-8-64 to arrive at a final solution.

A copy of action items from this meeting is attached.

4. COMMON S-II/S-IVB RECIRCULATION CHILLDOWN SYSTEM: Douglas Aircraft Company, Space and Information Systems Division (NAA) and MSFC have agreed that the following items can be common on the S-II and S-IVB stages:

a. Circulation pump.

b. Inverter.

c. Electrical connector on inverter.

The contractors will write a common specification which meets the most severe requirements of both stages.

5. LOCKHEED CONTINUING EFFORT: It is expected that the Lockheed contract NAS8-9500 will be executed during this week. Contract, value is $1.7 million, emphasizes cryogenic testing, materials development, and structural development programs.

Attachment #1: Action Items

SATURN/APOLLO MECHANICAL INTEGRATION PANEL ACTION ITEM REPORT

TO: SATURN/APOLLO Mechanical Integration Panel Members	REPORT NUMBER: M-[illegible]-MA-64-130
	REPORT DATE: March 18, 1964
FROM: (WORKING GROUP/SUB-GROUP) SATURN/APOLLO Mechanical Integration Panel, Meeting No. 7	MEETING DATE: March 17, 1964

ITEM NO.	ACTION AGENCY	DESCRIPTION OF ACTION
1	AGREEMENT	Sixth SATURN/APOLLO Mechanical Integration Panel (SAMIP) Agreement Item #6 revised as follows: "The MSFC will supply to the Manned Spacecraft Center (MSC)/ North American Aviation, Inc. (NAA) by May 15, 1964, a mating drill plate for the SATURN IB and V Lunar Excursion Module (LEM) Adapter/Instrument Unit (IU) Interface." (May 15, 1964, date was January 20, 1964.)
2	AGREEMENT	Sixth SAMIP Agreement Item #8 revised as follows: "It was agreed that MSC (Mr. R. L. Johnston) and MSFC (Mr. Holmes) will implement a materials information exchange program." (Mr. R. L. Johnston replaced Mr. Simmons.)
3	MSFC	George C. Marshall Space Flight Center (MSFC) (Mr. Furman) to provide report of capability of SATURN IB and V to withstand forces generated by a single engine and all control engines hard-over failure conditions by May 1, 1964. These reports are to be transmitted (by Mr. C. T. Boone, Jr.) to MSC, the Flight Mechanics, Dynamics, Guidance and Control Coordination Panel, and the Crew Safety Panel. (Agenda Items 2.b.(1) & (2))
4	MSC	MSC (Mr. Coloma) to coordinate spacecraft bending failure data requirements with MSFC (Mr. J. Stevens) and furnish report by April 1, 1964. (Agenda Item 2.b.(3))
5	MSFC	MSFC (Mr. Boone) to provide to MSC (Mr. Graves) by May 1, 1964, the MSFC Boilerplate (BP) 27 and LEM Test Article (LTA) 2 data package requirements. (Agenda Items 2.b.(4) & (5))
6	AGREEMENT	MSC desires to utilize the fuel dispersion system in the S-IVB instead of incorporating a complete separate system in the spacecraft. The Atlantic Missile Range (AMR) Safety Officer will agree to this if it can be shown that the supporting structure will remain intact until a point in the trajectory that a hazard to a land mass no longer exist. MSFC will support MSC in this effort. (Agenda Item 2.b.(6))
7	AGREEMENT	It was agreed that the current contacts for Interface Control Documentation (ICD) are Messrs. Baker (MSFC), Jaderlund (MSC), and Tooley (NAA and Grumman Aircraft Engineering Company (GAEC)). (Agenda Item 2.c.(1))

Lyle M. Jenkins, MSC — H. R. Palaoro, MSFC — Co-Chairman

Attachment #1

MSFC - Form 1781 (April 1963)

SATURN/APOLLO MECHANICAL INTEGRATION PANEL ACTION ITEM REPORT

TO: SATURN/APOLLO Mechanical Integration Panel Members

REPORT NUMBER: [illegible]

REPORT DATE: [illegible]

FROM: (WORKING GROUP/SUB-GROUP) SATURN/APOLLO Mechanical Integration Panel, Meeting No. 7

MEETING DATE: March 17, 1964

ITEM NO.	ACTION AGENCY	DESCRIPTION OF ACTION
8	AGREEMENT	Stiffener plates will be added to all flight boilerplates (BP-13,15,16,&26) in accordance with NAA MCR #A633.
9	MSC	MSC (Mr. Jenkins) to investigate impact of MSFC's requirements, as presented in Memorandum R-P&VE-VK-64-10, to paint BP-13 (SA-6) adapter black and add camera targets. MSFC provided "Paint And Application Specification," J10M10396.
10	AGREEMENT	MSFC has no requirement to paint the Launch Escape System (LES) red. We surface don't B
11	AGREEMENT	MSC will provide offloaded LES for BP-16 and 26. (Agenda Item 2.e.(3))
12	AGREEMENT	BP-27 less Spacecraft LEM Adapter (SLA) may be provided earlier than the presently scheduled date of January 15, 1965, (possibly by December 1, 1964). (Agenda Item 2.f.(1))
13	MSC	Mr. Jenkins to investigate feasibility of providing BP-27 SLA to MSFC on January 15, 1965. (Agenda Item 2.f.(1))
14	MSC/MSFC	MSC (Mr. Colonna) to provide interface design data document to MSFC by April 1, 1964. MSFC will review document and recommend method of maintaining it in an updated condition. (Agenda Item 2.c.(3))
15	MSC	MSC (Mr. Jenkins) to review vehicle alignment target request presented in Memorandum R-P&VE-VSA-64-135 and comment by April 7 on incorporation of targets. (Agenda Item 2.c.(4))
16	MSFC	Mr. Edwards to provide MSC (Mr. Colonna) by April 1, 1964, drawings of the electrical instrument panels proposed for mounting in the SLA, or information that panels are not required. (Drawings are to include panel configuration and bolt number and spacing.) (Agenda Item 2.d.(1))
17	MSFC	MSFC (Mr. Edwards) provided MSC a layout of IU cable and bracket installation which protrudes into the adapter area. The envelope was agreed upon and will be incorporated in ICD 13M50123. (Agenda Item 2.d.(2))
18	MSFC/MSC	An envelope of LEM protrusion into the IU/S-IVB was discussed. Marked-up drawings will be reviewed by both centers, and an acceptable envelope will be agreed upon by April 7, 1964. (Agenda Item 2.d.(3))

Lyle M. Jenkins, MSC — H. R. Palaoro, MSFC — Co-Chairman

MSFC - Form 1781 (April 1963)

SATURN/APOLLO MECHANICAL INTEGRATION PANEL ACTION ITEM REPORT

TO: SATURN/APOLLO Mechanical Integration Panel Members	REPORT NUMBER: M-MVE-M-64-130
	REPORT DATE: March 18, 1964
FROM: (WORKING GROUP/SUB-GROUP) SATURN/APOLLO Mechanical Integration Panel, Meeting No. 7	MEETING DATE: March 17, 1964

ITEM NO.	ACTION AGENCY	DESCRIPTION OF ACTION
19	MSFC	Messrs. Webber and Kistler to establish preliminary sequence of operations of personnel in IU/Adapter Interface area by April 15. (Agenda Item 2.d.(5))
20	MSFC	Mr. Jacobi to investigate the feasibility of supporting the LEM platform from the IU platform (or integral platform) by April 15. (Agenda Items 2.d.(4) & (5)) Are we talking about the gyro platforms? Clear, precisely; as intended here? Mr. Palaoro B
21	MSC	Mr. Colonna to provide MSFC by April 7 preliminary layouts of structural details of the SLA. (Agenda Item 2.d.(6))
22	MSC/MSFC	Mr. Graves (MSC) and Mr. Boone (MSFC) to establish Ad Hoc Group to determine by April 15 the Ground Support Equipment (GSE) required to support BP-27 and LTA-2 at MSFC. (Agenda Item 2.f.(2))
23	MSC	Contractor assistance to be provided to MSFC on BP-27 and LTA-2. This assistance to be one GSE individual and one structural and mechanical individual for a period of approximately two weeks in one or more trips. (Agenda Item 2.f.(3))
24	MSFC/MSC/ NAA	Preliminary structural ICD for BP-27 to be provided by April 15. Mr. Baker (MSFC) and Mr. Tooley (NAA) to determine date that remainder of ICD will be available. (Agenda Item 2.f.(4))
25	MSC	Mr. Jenkins to identify contact for electromechanical sequencing and determine need for subpanel by April 1, 1964. (Agenda Item 2.k.(3))
26	MSC/MSFC	MSC will offload 1600 lbs. + 50 lbs. of ballast from BP-13 (SA-6 payload). This figure is based on NAA Report Number SID 63-143-8, "Actual Weight And Balance Report, Boilerplate Stack No. 13," dated February 3, 1964. This ballast will be removed from the Service Module (S/M) and Adapter without a schedule slip. The remaining ballast in the S/M and Adapter will be distributed symmetrically in the Adapter. MSFC will return BP-9 dynamic test article with set of dummy RCS from BP-16 to MSC about July 15, 1964, for dynamic testing for about two months. (Item from floor - Mr. Palaoro)

Lyle M. Jenkins, MSC — H. R. Palaoro, MSFC — Co-Chairman

MSFC - Form 1781 (April 1963)

SATURN/APOLLO MECHANICAL INTEGRATION PANEL ACTION ITEM REPORT

TO: SATURN/APOLLO Mechanical Integration Panel Members	REPORT NUMBER: M-[illegible]-[illegible]-130
FROM: (WORKING GROUP/SUB-GROUP) SATURN/APOLLO Mechanical Integration Panel, Meeting No. 7	REPORT DATE: March 16, 1964
	MEETING DATE: March 17, 1964

ITEM NO.	ACTION AGENCY	DESCRIPTION OF ACTION
27	MSC	Mr. Bullard (MSC) to provide MSFC (Mr. Marmann) with summary weights data on BP-13 after shift of ballast. (Item from floor - Mr. Marmann)
28	MSC	MSC (Mr. Bullard) to provide MSFC (Mr. Marmann) with weight and balance log on each boilerplate immediately after flight. (Item from floor - Mr. Marmann)
29	MSC	Mr. Jaderlund (MSC) to ascertain delivery date of "spacecraft mockup for access arm check." (Estimated to be about April 15, 1964) (Item from floor - Mr. Bauph)
30	AGREEMENT	MSFC now does not need the BP/AMRM stiffness comparison requested in Fifth SAMIP. (Item from floor - Mr. Colonna)
31	AGREEMENT	Tentative date for Eighth SAMIP is June 24, 1964, and agenda to be out about June 3, 1964.

Lyle M. Jenkins, MSC H. R. Palaoro, MSFC Co-Chairman

MSFC - Form 1761 (April 1963)

NOTES 3/23/64 CONSTAN

1. STATUS OF SI-8

Overall testing is approximately 95% complete. The remaining test to be completed is Simulated Plug Drop and the evaluation of the telemeter records for the Instrumentation Compatability Test. Testing for SI-8 is approximately seven days behind schedule and the estimated date of completion of final acceptance testing is March 27, 1964.

FW 3/23

B 3/27

NOTES 3-23-64 DANNENBERG

1. Flight Missions Assignment - Since our conference with MSF, a number of changes have been introduced by Bellcomm and Mueller, the most serious one being that there will be only one set of S/C for both IB and V from 207 on. This will be discussed in the Management Council meeting where Tommy Thompson will present the latest charts. Also Mueller seems to feel that he does not need approval of Center Directors on mission charts as proposed by us.

This has been very thoroughly aired from all sides, though. I think we must adjust ourselves to this fact. B

2. SA-6 Payload Capability - Mechanical Integration Panel has agreed to remove 1600 lbs. from the SM. This will remove the payload discrepancy and a possible launch schedule slip. ✓

3. LES for SA-8 and SA-9 - MSC has finally agreed to supply LES configuration for the micrometeorite payloads. ✓

4. Weight and Performance Control - At the request of IO, action has been taken by R&DO to initiate an effective weight and performance control for IB. ✓

fw 3/27

NOTES 3/23/64 FORTUNE B 3/27

1. From mud to dust and mosquitoes in Mississippi happened in just a few days. All roads are in good shape, the contractors are wetting them down as necessary to permit their trucks to operate at normal speeds. The first hatch of mosquitoes is out but not too bothersome yet. General Electric is prepared to fog work areas as needed. Our mosquito control commission is preparing long range plans for the surrounding area - Jackson, Harrison, Hancock, lower Pearl River County of Mississippi, St. Tammany Parish, Louisiana. ✓

2. Equal Employment Opportunity. Marion Kent and I called on John Hardy, Commanding General, Kessler Air Force Base, Monday to discuss top management considerations. Hardy stated he had never had to cite a restaurant or lodging place out of bounds because there had been no reported discrimination on the Coast. Colored servicemen, riding buses out of the base to town, have sat where they wanted. On occasions a "red-necked" driver might tell a Negroe getting on the bus in town to move to the back, but no military personnel have reported such. He said he would be glad to put a government visitor like Hobart Taylor in one of the guest houses, if we could not find him a place. We have arranged for a future appointment with the personnel officer, Veteran's Administration, Biloxi, to talk over his practices. Mississippi State University has confirmed that they will include colored colleges in their study on technician training. Very good, practical approach. B

3. And visitors Mr. Edwards, J. Callahan, Representative U. S. Civil Service Commission, Atlanta region, visited MTO Wednesday, March 18, 1964. Kraft Ehricke came over and Friday we had a multitude, the NASA wide construction standards group. ✓

Fw 3/23

NOTES 3/23/64 GEISSLER B 3/27

Killy Mrazek FYI B

1. Review of The Boeing Company Abort Studies: During an Aero-Astrodynamics Laboratory review (March 12, 1964) of abort studies conducted by The Boeing Company, the following three important conclusions were reached: (1) The S-IC stage ground rules should be amended to require one engine out capability (either a control engine or the center engine) from the time of S-IC umbilical tower clearance to S-IC cutoff; (2) The S-II stage ground rules should be amended to require one engine out capability (either a control engine or the center engine) from the time of S-II ignition to S-II stage cutoff; (3) The S-IVB stage ground rules should be amended to require S-IVB start capability at any time during flight following S-IC cutoff. Incorporation of these ground rules would yield vehicle flexibility to accomplish missions other than the LOR landing mission such as abort through orbit or controlled landing location aborts. Effort is being initiated to modify the vehicle ground rules.

2. Saturn I SA-6 Status: SA-6 is planned as follows: (1) The guidance loop during the burn of the S-IV-6 stage will be closed. The guidance polynomial derived for SA-7 will be flown on SA-6 since this polynomial has been subjected to thorough simulation by Astrionics Laboratory. A velocity cutoff will be employed in the S-IV-6 stage. (2) The S-I-6 stage cutoff will be given by level probes in the fuel and lox tanks as originally planned (same as SA-5). The request from R-AERO-DIR to R-DIR DATED Feb. 25, 1964 (copy attached) to allow LOX depletion in the S-I-6 stage as in SA-7 has been rescinded due to complications placed on R-P&VE and R-ASTR. The resulting bias on the guidance system is small and can be easily compensated by the system. (3) For performance reasons, it was necessary to reduce the weight of ballast in the spacecraft (BP-13) by 726 kg (1,600 lbm). Thus, the weight of the ballasted payload will be 17,000 lbm instead of 18,~~000~~ 888 lbm. After considerable negotiations, MSC has stated that the ballast will be removed with no slippage resulting. (Saturn Apollo Vehicle Systems Integration Panel Meeting, 3/17/64) MSC will rerun their shell mode test on the service module to determine the transfer function of structural to aerodynamic buffeting and accoustical noise to establish the internal vibration environment. BP-009 will be shipped to MSC after MSFC has completed SA-9 dynamic testing (July). BP-009 mass will be modified to simulate BP-13 for the shell mode test. (4) The cracks in the common bulkhead of the S-IV-6 stage have been alleviated and SA-6 is back on schedule. ✓

3. SA-9 LES Tower: Dr. Shea has informed Mr. James that MSC will furnish off-loaded LES tower for SA-9 & 8 (BP-16 & 26) as requested by MSFC. ✓

4. Saturn Tracking Requirements: In his visit to MSFC on January 3-4, Dr. Mueller requested an analysis of our requirements for tracking instrumentation on Sat IB and Sat V with emphasis on items within the Instrument Unit (Azusa, Mistram, C-band Radar, Altimeter, AROD). This study is now complete and being signed. It is felt that sufficient justification for each item is presented so that Dr. Mueller hopefully will not insist on a drastic cut of this vital instrumentation. ✓

5. SA-5 Roll Moment: The nature of the mysterious roll moment has been identified by AERO-A (unsymmetry of the turbine exhaust duct arrangement on the vehicle). Since roll angles up to 6^{o} may be expected in future flights, some fix will be requested by ASTR for SA-7 and subsequent. ✓

Ref. A

B-2

GEORGE C. MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA

Memorandum

TO Mr. Weidner, R-DIR DATE February 25, 1964

FROM R-AERO-DIR, Aero-Astrodynamics Laboratory

SUBJECT Proposed SA-6 Changes

1. A recent decision was made to close the guidance loop during the burn of the S-IV stage of SA-6, thereby making it the first Saturn I guided flight instead of SA-7. Since Astrionics Laboratory has gone through a detailed simulation of the guidance for SA-7 rather than SA-6, Astrionics Laboratory has requested that the SA-7 guidance polynomial be used for SA-6 as the mission profiles of the two vehicles are similar. An investigation by Aero-Astrodynamics Laboratory has shown that it will be feasible to fly the SA-7 guidance polynomial on SA-6; however, an extra load (deviation from nominal) will be put upon the guidance due to the fact that the S-I-7 stage will be cut off by LOX depletion, while the S-I-6 stage was not scheduled to have depletion cut-off, thereby leaving approximately 6,000 pounds of otherwise usable propellant on board. It is recommended that the probes now in the LOX tanks of SA-6 be replaced by shorter probes, which will allow LOX depletion as in SA-7, and that necessary changes in the circuitry be made. This will make the performance of the SA-6 vehicle so near to that of SA-7 that the guidance polynomial prepared for SA-7 can be used to guide SA-6 without a bias.

2. In order to evaluate control forces, fin loads, and establish the stability ratio more accurately than was possible in SA-5, it is necessary to fly the vehicle through the high dynamic pressure region with an angle-of-attack of approximately 3 to 4 degrees. The bias of the tilt program will be achieved by a profile which will allow the angle-of-attack to build up from 0 to 3° or 4° and remain near that value for a period of approximately 30 seconds during the flight through the high dynamic pressure region. The effects of winds during flight will not cause the angle-of-attack to exceed 5.5° in this region. According to R-P&VE Laboratory, no structural limit will result from such a bias of the tilt program. This bias will impose no extra load on the S-IV-6 guidance as its effect will be damped out before S-I-6 cut-off. The biased tilt program will be delivered to Astrionics Laboratory by February 29, 1964.

3. It is understood that these changes will cause no slippage in the schedule.

E. D. Geissler

Distribution:
Dr. Geissler, R-AERO-DIR
Dr. Haeussermann, R-ASTR-DIR
Dr. Hoelzer, R-COMP-DIR
Mr. Kuers, R-ME-DIR
Dr. Stuhlinger, R-RP-DIR
Dr. Mrazek, R-P&VE-DIR
Mr. Grau, R-QUAL-DIR
Mr. Heimburg, R-TEST-DIR
Mr. Paul, R-P&VE-P
Mr. Palaoro, R-P&VE-V
Mr. Fichtner, R-ASTR-E
Dr. Gruene, LVO-DIR
Col. James, I-I/IB-DIR
Mr. Vreuls, I-I/IB
Mr. Horn, R-AERO-D
Dr. Speer, R-AERO-F
Mr. McNair, R-AERO-P

NOTES 3-23-64 GRAU B 3/31

1. S-I-7 POST-STATIC CHECKOUT: Post-static checkout of the S-I-7 stage has been temporarily halted pending rework of electrical defects. The stage is to be retained in the manufacturing area of building 4705 until 3-25-64.

2. S-IU-7 CHECKOUT: Modification and rework of distributors have been accomplished, and the distributors reinstalled on the S-IU-7 Instrument Unit. This Laboratory's release date to Manufacturing Engineering Laboratory has been extended to May 13, 1964. Accordingly, checkout has been re-cycled to the beginning, thereby allowing all flight items to be tested except the ST-124 Platform and the Control Acceleration Switch.

3. S-IV-7 POST-STATIC CHECKOUT: A reduced post-static checkout schedule for the stage has been established by Industrial Operations in order to get the stage back on schedule. This Laboratory is presently outlining a test program which will yield the highest level of confidence for the time allotted.

4. S-IV-9 POST-MANUFACTURING CHECKOUT AT DAC, SANTA MONICA: Checkout operations on the S-IV-9 stage have been temporarily stopped due to part shortages. There are at present 70 instrumentation channels which cannot be calibrated due to these shortages. Modifications are being accomplished during the interim, with a 7 to 10 day slippage estimated.

5. MICRO-METEROID CAPSULE PROGRAM: A quality survey of the Bladensburg and Hagerstown, Maryland, facilities of Fairchild Stratos Corporation was completed using the Office of Manned Space Flight Quality Program Evaluation Procedure (R-2). The survey indicated that the contractor was, in general, meeting all requirements of NPC 200-2. Fairchild Stratos is, however, encountering serious difficulty in manufacturing detector panels. A total of 29 detector panels, of 416 required, has been accepted for Prototype use only. A bad batch of mylar resulted in the scrapping of over 75% of the panels made, and although new mylar has been received, technical and manufacturing difficulties have not been overcome. It is estimated that Fairchild Stratos is 6 to 8 weeks behind the Prototype schedule.

RPL Doesn't look so good! B

6. IMPLEMENTATION OF ACCEPTANCE,TEST OR LAUNCH LANGUAGE (ATOLL), S-II: As a follow-up action to discussion and correspondence with Mr. Neubert's office, programming personnel of this Laboratory visited NAA/Downey to clarify and establish effectivity of implementing the ATOLL plan on the S-II program. Agreement was reached that ATOLL would be implemented on the first flight stage. Meanwhile, NAA/S&ID will continue their present programming effort for use on the All-System Vehicle (S-II-T). Parallel with this effort, an immediate ATOLL programming effort will be started by the Autonetics Division programming personnel. This Laboratory is continuing follow-up to determine if the S&ID programming effort associated with S-II-T can be terminated.

fw 3/23

B 3/27

NOTES 3/23/64 HEIMBURG

*fw 1. F-1 ENGINE TESTING (STATIC TEST TOWER WEST):

Engine F-1001 was reinstalled in the test stand on 3/16, and a 41-second mainstage test was successfully performed on 3/20. After the test, it was found that the No. 2 main lox valve opening control line had developed a fuel leak at the flange sleeve to line weld. This has subsequently been repaired.

Preparations have been underway for the dual tests to be performed on 3/24. A simulated launch countdown of the S-I-9 stage was performed in conjunction with the F-1 firing on 3/20. It was determined that the F-1 can be fired within 10 minutes after the ignition signal on S-I-9. For the tests on 3/24, a lox depletion test will be run on both S-I-9 and F-1001. S-I-9 will run approximately 140 seconds, and F-1001 will run about 60 seconds. ✓

2. SATURN V GROUND SUPPORT EQUIPMENT (GSE) TEST FACILITY:

Because of the requirement for vehicle motion simulation on the checkout of the Saturn V swing arms, a development program for the simulators was initiated. This job was let to the American Machine and Foundry Company (AMF) at Stamford, Connecticut, on a Cost-Plus-Fixed-Fee basis for $854,989.00.

Due to technical problems encountered in the development of the servo mechanisms and some instrumentation overruns, the total cost of the GSE facility is overrunning about $500,000.00. We have persuaded AMF to put a ceiling on their contract; however, we do not have sufficient Construction of Facilities (C of F) funds to cover the additional costs. We obtained $500,000.00 FY 1963 C of F funds from Kennedy Space Center and requested reprogramming authority from NASA Headquarters. Because this job was funded on an emergency supplemental appropriation in the first place, the Congress must authorize any reprogramming action. Dr. Mueller has refused to take any action (go to Congress) on the reprogramming, and has told us to solve our own problem. Yes, we should! I agree

We have been working with Mr. Gorman and Mr. Shepherd, and are looking at the possibility of funding the development part of the AMF contract with research and development funds. This procedure looks feasible at this time. ✓

fw 3/23

NOTES 3-23-64 GRUENE B 3/27

1. SA-6 Status

a. S-IV was erected on March 19, IU will be erected on March 23. ✓

b. The decision was made to take 1,600 pounds of ballast out of the Service Module and the Adapter. Since no redistribution is required, we were informed by Preston's people that they can deliver the spacecraft to the pad without delaying our target date. ✓

c. Despite the delay in S-IV pad erection, it was possible still to shoot for our original firing date by:

(1) Allowing DAC to work 24 hours per day for an extended period of time.

(2) Deleting certain DAC tests deemed previously necessary by DAC prior to electrical mating. These tests are, any way, repeated during overall launch vehicle tests.

(3) Scheduling work on weekends which normally were used for changes, solution of unforeseen difficulties, etc., (e.g., RFI problems on SA-5).

(4) Cutting short the time available for our first automated overall test and its evaluation. Hopefully not too short. This is important! B

All this means we are now very tight in the schedule for the rest of the preparations.

d. No major problems are foreseen right now in delivery of components to keep the new schedule, but again it has to be emphasized that delivery dates have to be kept to the date, (e.g., ST-90 cam, Guidance Signal Processor, etc.).

2. Regarding Kuers' Notes of March 16, "Quality Specifications." Since LVO feels obligated to judge workmanship in components according to established quality specifications, it is necessary that a way has to be found to bring quality and manufacturing organizations together to an agreement on these specifications. Since we are in the "middle" of it, we need this decision urgently. We were not aware that these discrepancies existed.

Eberhard Please look into this B

3. Attached is a picture showing the VAB status as of March 2, 1964. (NOTE: Picture attached to Dr. von Braun's Notes only.) ✓

NOTES 3/23/64 HAEUSSERMANN

1. SA-6 SIMULATION: Five degree-of-freedom hybrid simulation in preparation for SA-6 guidance hardware check out has produced results with excellent correlation with generated test runs. Schedule problem on hardware release and availability of some input data may preclude performing simulation including some final data; however, adequate confidence in the hardware and system should be confirmed by present simulation data.

2. SA-9 SCHEDULE PROBLEM: (Initially reported in 3/9 Notes) Serious scheduling problem for release of shaping networks and control gains becomes more apparent since dynamic test (although started) is some nine days behind schedule and elastic body data from theoretical analysis is not completed for use in design studies.

3. S-II DYNAMIC AND CONTROL WORKING GROUP: At the Working Group Meeting and the Thrust Vector Alignment Splinter Meeting held at Downey, California, on 2/25/64, no representatives of the IO Office in Huntsville or Downey were present. Although this could have been caused by unforeseen circumstances, the absence of IO representation does dilute the effectiveness of the working group operation. A status report of this Working Group was given in 3/16 Notes.

4. ST-124M ACCELEROMETER: The first AB-3, K-8, accelerometer has been assembled and tested. K-8 designates the type of accelerometer used on Saturn IB/V and differs from the Saturn I type in the encoder and mounting. The K-8 encoder is directly coupled to the gyro head eliminating need for the 5:1 gearing. Encoder resolution has been improved from 0.1 m/sec/bit to 0.05 m/sec/bit and complete redundant capability provided with each encoder. A three point mount design instead of the cradle is used on the K-8 unit. The unit will be sled tested in 5/64. Calibration data indicated a small misalignment of the mounting surface or trunnion axis. This error was small, 0.001 m/sec^2. The linearity of the encoder indicated a small error of 0.0005 m/sec^2. This error is equivalent to an angle error of approximately 15 arc seconds. The encoder was measured statically with a maximum error of 14 arc seconds peak-to-peak. The unit calibrated within performance specification.

The constant bias term was measured to be 0.0007 milliseconds of time which is equivalent to 0.0002 m/sec^2.

The repeatability of the unit was 0.0002 milliseconds of time which is equivalent to 0.00007 m/sec^2.

B 3/27

NOTES 3-23-64 HOELZER

RECRUITMENT PROBLEM: Projects and Industry Applications Division is having difficulty hiring Computer Systems Administrators at the GS-13 level and above because of a strict interpretation by the Personnel Office concerning AST registers. Up to now business computer personnel have been available through a register in Washington, D.C. While service on this register has been slow, we have always managed to obtain key personnel through it. When NASA established the AST Part III (Administration) register, it forced us to qualify computer personnel through the local register. In some cases this is satisfactory, however, the register requires two years experience on the part of the individual in an R&D organization. This seriously restricts our ability to recruit since there are few business computer systems people available with space industry or R&D backgrounds. The Personnel Office has indicated that they see no way to allow us to hire other than the local AST Part III Administration register. This restriction on acceptable experience may pose a problem for other organizations at MSFC, and if so should be solved.

Harry S.
Please look into this B

fw 3/23

B 3/27

NOTES 3/23/64 JAMES

SATURN I - S-IV Contract Negotiations - Completed the technical and cost negotiations on Friday, March 20. Fee negotiations will begin after a one week recess, which is felt required in order to evaluate the Douglas position in favor of fee. MSFC's position is that no additional fee is justified on the overrun. This negotiation will resume Monday, March 30 at MSFC. Incentive contracting has been determined by the Contracts Office to be of no value to the government and is not a part of this exercise.

*fw S-IV-6 - Erection of the S-IV Stage was completed March 19. Electrical mating is now scheduled for April 2, 2 days later than originally planned. The original launch date prior to the bulkhead problem is still considered the target launch date.

*fw SA-6 Payload Weight - MSC has agreed to remove the 1,600 lbs. from the spacecraft to permit circular injection without affecting the launch date.

*fw LES for SA-9 and 8 - MSC (Dr. Shea) has agreed to furnish the LES towers for SA-9 and 8 flights. At MSC's request, MSFC will furnish the Apollo Boilerplate being used for dynamic testing (after SA-8 and 9 dynamic test) to MSC for 2 months (July and August 64) for vibration tests.

SATURN IB - GSE - Bob Young detected last week a problem existing between DAC and ourselves concerning the timeliness and accuracy of DAC controlled drawings for use in developing our GSE for 201. As a result, a series of meetings were held with Fichtner and his people and several long-distant calls placed with Ted Smith and Jack Bromberg. DAC has maintained that if they interrupt their present system for any sort of in-series approval of wiring drawings, it will delay the availability of S-IVB-1. On the other hand, Fichtner must insure compatibility of the wiring drawings on 201 if the stage is to mate with the GSE at the Cape. We now have a procedure being worked out which is much more satisfactory to both DAC and ourselves than we have been able to achieve so far. It is planned that Bob Young, Fichtner, and myself, will meet with DAC at Huntington Beach on 8 April 1964 and decide on a final agreement.

H. Fichtner FYI B

Saturn IB Breadboard - The I. U. Simulator and ESE as now estimated by Astrionics will not be operational in the Saturn IB Breadboard until April 1, 1965. Also, the Breadboard will not be in the SA-201 configuration until the middle of June, 1965. This late operational date for the Breadboard complicates and greatly reduces the benefits to be received from this facility for SA-201 since IU-201 Checkout begins May 10, 1965.

S-IVB Battleship - Current indications are the start of Battleship cold flow and hot firing tests will probably slip 3 to 4 weeks to late May and late July 1964 respectively. This delay is due primarily to hardware deliveries. Efforts to improve the situation are being taken and results will be known next month.

fw 3/23

AHK IB, I hope

NOTES 3-23-64 Koelle B 3/27

1. SATURN IB MARKETING: Our efforts in this area have resulted in a formal proposal (letter M-GMT 8122, March 4, 1964) from Mr. Gray to Dr. Mueller, suggesting that six SATURN I's, in addition to those presently on order for the APOLLO program, should be asked for in the FY 1966 program.

2. NASA ORBITAL LABORATORY POLICY: The Planning Review Panel recently proposed two policy questions to Dr. Seamans. These are:

a. Does NASA support the position that a manned orbiting laboratory designed for and devoted to research and development may be required in the late 1960's, or early 1970's, and that NASA studies and planning should be directed toward the possibility of such an objective?

b. What should be the role of Langley vis-a-vis the Manned Spacecraft Center in the development of a manned orbital laboratory?

Dr. Seamans' position was as follows. Paragraph a. and b. below correspond with Paragraph a. and b. above.

a. NASA should have an active study and planning effort in the area of manned orbital laboratories, to support the joint NASA and DOD effort directed toward defining the objectives and configuration of a national manned orbital laboratory, and to provide the information necessary for the agency to make FY 66 and FY 67 budget decisions, concerning whether development of such a laboratory should be initiated by NASA and, if so, what type of laboratory should be developed. ✓

b. The responsibility for the mission planning, studies of overall systems and flight operations, and development of a manned orbital laboratory, would be assigned to the Manned Spacecraft Center. The Langley Research Center would be expected to conduct research and technical development relating to manned orbital laboratories and, in this manner, to play a major supporting role. Study and planning effort relating to manned orbital laboratories should be conducted accordingly by both centers, so as to provide broad based support for the NASA planning effort in this area, and to prepare both centers for their respective roles in the development of such a system.

I FEEL THAT MSFC HAS A ROLE IN THIS ALSO Frank

fw Yes, they bried it, we'll have it. But we must participate in deciding that.

B

NOTES 3-23-64 KUERS

1. Saturn I, IU's: The power distributors for SA-6 and SA-7 have been returned to LOC and Quality Laboratory.

2. Saturn V, S-IC-T Stage Problems and Progress:

Fuel Container:

a. Both container halves have been moved into the tower building. I have deliberately imposed a hold on the next operation, the close out weld, because the present welding technique is still marginal in producing quality welds with respect to porosity. We are working feverishly for several weeks on the introduction of high speed welding techniques (approx. 25 inches per minute) and have already all the evidence that this change will be the solution to our porosity problems; but, we need about one more week in testing out the new process before applying it to the expensive sub-assembly of the Fuel Container.

b. The teflon bearing for the Lox Tunnel Bellows have again failed in qualification tests. Mr. Barlow, Special Assistant to Mr. Stoner, is personally looking into this problem. Also, one Lox Tunnel has been seriously damaged during shipment to MSFC. Repair efforts and expediting of a spare tunnel are underway.

c. Status of Fuel Container: This container is approximately 5 weeks behind schedule VII; this will have no affect on the T-vehicle because of a planned storage time for this container, prior to final assembly. It will, however, affect the schedule for the -S Fuel Container.

Lox Container:

a. The warpage problem encountered in vertical welding of skin segments has been solved by (1) prebending the panels so that the weld shrinkage pulls them straight and (2) by using two weld torches from the inside and the outside.

b. The dollar weld in the lower lox bulkhead has been successfully completed and the welding of the dome to the Y-ring is underway.

c. All gore segments for the upper lox bulkhead are ready for being joined on the meridian welder.

d. Status of Lox Container: The Lox Container is now approximately 6 weeks behind schedule VII. This has now become the pacing sub-assembly for the T-vehicle. We are concentrating all our efforts on this container and hope to recover some of the lost time. Except for the porosity problem in horizontal welding we foresee at the present no major problem for this container.

Thrust Structure:

The first skin panels for the Thrust Structure for -T have been received. This sub-assembly is approximately 2 weeks behind schedule and is not the pacing item any more because of our switch in the sequence of structural assembly.

Forecast for Delivery of the T-Vehicle: A delay in delivery of this vehicle to Test Laboratory of 2 to 4 weeks, reference schedule VII, is presently forecasted.

fw 3/23

NOTES 3-23-64 MAUS B 3/27

1. PROJECT SUPER (SUPPORT PROGRAMS FOR EXTRATERRESTRIAL RESEARCH) - There are currently eight tasks in process for accomplishment by the Air Force through the Project SUPER arrangement. These tasks are utilizing facilities and resources at three Air Force locations:

   Arnold Engineering Development Center
   Wright-Patterson Air Force Base
   Air Force Cambridge Research Laboratories

   Utilizing Air Force resources has resulted in contract amounts of $97 thousand for these tasks as opposed to the MSFC estimates for an out-of-house contract of $765 thousand. ✓

2. MIT ORGANIZATION RESEARCH PROGRAM - Mr. William M. Evan, Associate Professor of Sociology and Industrial Management at Massachusetts Institute of Technology, is here today to discuss MIT efforts under NASA grant #NSG 235-62 for research in problems of organizing and managing large-scale technology-based enterprises.

   Mr. Evan has completed his preliminary investigative work at Ames and Langley. His survey approach at MSFC proposes to use questionnaires and personal contact with some 135-150 people.

   We will discuss his proposed survey with him today, and will report more information on this matter next week. H.M. Unusually interested B

3. FY64 FUNDING SITUATION - The MSFC position for the March MSF Program Review is that we will have approximately $423 M uncosted obligations on June 30, 1964. This compares with headquarters (D. Wyatt's office) estimate of $436 M. Both figures include the $110 M supplement. ✓

   $228 M are encumbered but uncosted: $117 M in major contracts (over $500,000) and $111 M in fixed price and minor contracts.

   This leaves $195 M unencumbered. Since the $110 M supplement is for obligation in FY64 for costing in FY65, it should not be used for comparison. The remaining $85 M unencumbered constitutes 5.9 % of this year's accountable funds (including all prior year uncosted). This compares with 9.4% in FY63.

   Not bad, considering late passage of appropriations bill! B

NOTES 3-23-64 McCartney B3/27

1. R&D OPERATIONS PERSONNEL MEETING: Mr. Ellis, my Administrative Officer, met last week with R&D Operations Resources Management Chiefs to arrive at a clear understanding of our personnel problems associated with the more than 400 personnel requests in the Personnel Office. The meeting was one of a series in which we are preparing ourselves for a better understanding of the March 25 overall MSFC personnel presentation arranged by Mr. Gorman.

2. CRITERIA FOR MANPOWER CONTROL: On March 19, we published criteria for the control of contractor manpower. The following day, we met with R&D Operations Resources Management Chiefs to explain the manpower planning system. Each laboratory and office will use this system to produce their own detailed plans. We will begin this week to review those plans with each R&D Operations element. We will then thoroughly study, with the laboratories, the application of the control system to individual contracts.

3. FY-66 CONSTRUCTION OF FACILITIES BUDGET: On March 17, the R&D Operations laboratories and offices presented their proposed FY-66 CofF projects to Mr. Weidner. The consolidated Marshall FY-66 Program is scheduled to be presented to you on March 31. My Facilities Group is also coordinating with the laboratories in preparing scopes of work for FY-66 advanced facilities design studies. We expect that NASA Headquarters will fund these studies by April 1.

4. RESOURCES MANAGEMENT CONFERENCE: The third regular Resources Management Conference was held March 17. Subjects suggested by the laboratories were discussed and are being actively followed up, including the problem of R&D personnel actions.

5. FY-64 ADMINISTRATIVE BUDGET EXECUTION: NASA Headquarters has advised that the language of the FY-64 Appropriations Act precludes use of R&D funds for Repair and Alterations Projects. In consequence, more than $2M worth of projects must be re-evaluated against the possibility of using Administrative Operations funds - the area where the President has asked us to tighten our belts. We are working closely with the Facilities & Design Office and FMO in clearing up this matter. We are also evaluating the impact of the Appropriations Act ruling on internal R&D Operations administrative areas.

6. NON-SATURN PROGRAMS STUDY: My Programs and Contracts Group has prepared a summary of all FY-64 non-Saturn programs. Our study indicates that about $27M (of an authorized $59.6M for FY-64) remains to be obligated. We are coordinating with the laboratories and offices to assure use of most of the $27M by April 15, a date established to permit fund obligation by June 30.

NOTES 3/23/64 RUDOLPH

B 3/27

1. S-IC Stage:

Technical Direction Meetings - Monthly Technical Direction Meetings have been initiated with Boeing. The first meeting is scheduled for Mar 24, at 9:00 am, in the S-IC conference room (HIC Bldg).

Technical Directives - Technical Directives are presently taking up to 90 days for processing. Efforts are underway to significantly reduce the MSFC-Boeing-MSFC flow procedure. A trial procedure has been implemented with P&VE to have MSFC-Boeing coordination performed during a weekly meeting prior to submittal through proper channels. Agreements reached during the first meeting would normally require an average of 33 days under the previous method of operation.

S-IC-T Status - Fuel Tank delay has been reduced from six weeks to five weeks. Vertical assembly operations have started and preparations are being made for fuel tank close-out weld. LOX Tank delay continues to be five weeks. Lower bulkhead assembly is continuing. Thrust Structure delay continues to be three weeks. All major structural components, except heat shield, have been received by MSFC. Intertank Section is scheduled to arrive on dock, MSFC, the last week of March 1964. Forward Skirt delay has been reduced to one week as a result of new demand date by ME Lab. Specialty Hardware - One of the most critical items is the helium high pressure manifolds. This item has been dual sourced to Solar and Flexonics and the best delivery on unqualified hardware is currently seven weeks later than the demand. Joint MSFC-Boeing liaison teams have been established to aid in improving vendor delivery dates.

2. S-II Stage Weight Reduction Study - On Mar 18, NAA/S&ID presented the results of the S-II stage weight reduction study. A total of 13 change proposals were presented which reflected a possible stage dry weight reduction of 10,527 pounds at a cost of 16.2 M.

3. Auxiliary Propulsion System Redesign and Ullage Motor Selection - A meeting was held at NASA Headquarters with Dr. Mueller on Mar 18 to resolve auxiliary propulsion system redesign and ullage motor selection. Dr. Mueller agreed to allow MSFC to proceed with the present Saturn IB stage module and redesign the Saturn V module to optimize on the continuous ullage mode of operation. This eliminates the 1750 lb Marquardt motor, adds solids for separation and uses a Gemini 100 lb ullage motor unmodified. The payload savings will be approximately 1850 pounds.

4. Instrument Unit Integration and Checkout - The draft procurement plan amendment for the IBM effort, discussed with IBM on Mar 9 and with NASA Headquarters on Mar 17, has been rewritten to incorporate Headquarters' recommendations. The rewritten draft was forwarded to NASA Headquarters on Mar 19, and it is anticipated by Headquarters and MSFC to have approval of this amendment by April 1, 1964.

B 3/27

NOTES-3-23-64-SHEPHERD

F-I Test Stand at Edwards Air Force Base (EAFB): Final inspection for beneficial occupancy for Test Stand ID at EAFB was held March 19, 1964 and was accepted by MSFC and Rocketdyne. Total construction time for this stand was 17 months. Test Stand IC will be completed about April 30, 1964 and Test Stand IE with environmental simulation capability about August 1, 1964. The construction work for the EAFB stands was under the direction of the Corps of Engineers, Los Angeles District.

Visit of General Hayes: General Hayes has set a trip for the orientation of General Wilhoyt, General Hayes' replacement as Assistant Chief of Engineers for NASA support. The party is scheduled to be at Michoud and Mississippi Test Operations on the 2nd of April and Huntsville on the 3rd of April. The party includes Generals Hayes, Wilhoyt and Harvey; Col. Dyer, House Space Committee; Col. Tufts, Senate Committee and Bob Long of NASA Headquarters. Others in the party make a total of 19 people.

B 3/27

NOTES 3-23-64 Stuhlinger

1. MICROMETEOROID SATELLITE THERMAL DESIGN: Early studies made by RPL of the Micrometeoroid Capsule revealed that the thermal problems of the electronic package cannot be completely solved by passive means. It was decided in August, 1963, to use an active system of the type flown on the Mariner II, using a set of louvers which allows change of the effective infra-red emittance. The drawings of the louvers were obtained from JPL by FSC for fabrication, integration into the package, and testing. The proper functioning of the louvers is still a problem area at the present time. We are keeping in touch with P&VE and FSC, and follow this area closely to assure that the actions taken by FSC are satisfactory. ✓

2. STATUS OF SRT PROGRAM: The current status of the SRT programs managed by RPL is as follows:

	ANNUAL PLAN	PROGRAM AUTHORITY	PROCESSED TO FMO	OBLIGATED
OART	10,409,000	10,409,000	7,237,000	1,512,409
OMSF	14,163,000	14,133,000	7,594,938	182,000
OSSA	675,000	675,000	461,346	17,265
	25,247,000	25,217,000	15,293,284	1,711,674.

An additional $200,000 was received from OART on March 18. It is reflected in the annual plan. ✓

3. SA-10 PAYLOAD: Dr. Seamans and Dr. Mueller decided that a third MMC (the present spare capsule for flights SA-8 and 9) will be flown on SA-10. Shroud and trajectory will be identical to those of SA-8 and 9. RPL had suggested that a light fairing (FSC-built) should be used, allowing an apogee of about three earth radii, and providing valuable meteoroid data at large distances. The decision to not use a light fairing was apparently dictated by fund limitations. ✓ Saturn I/IB office and P&VE are checking into availability, condition, and cost of the boilerplate nose structure for SA-10; RPL is checking cost of an FSC fixed price contract for a light fairing, but unchanged experiment capsule. ✓

4. ENGINEERING EXPERIMENTS FOR ORBITAL RESEARCH LABORATORY: Mr. Jerry Johnson of this Laboratory attended, as the MSFC representative, a meeting of the Engineering Experiments Working Group of the ORL Planning Committee composed of representatives of OMSF, OSSA, and OART. As a result of this meeting on March 18, MSFC and other centers have been requested to submit work statements for engineering experiments which will be considered by Headquarters for the initiation of study contracts. We have started to discuss this with interested groups in other laboratories. We discussed deep space propulsion experiments with Mr. J. F. Blumrich and with Mr. E. Hellebrand. ✓

THIS COULD OPEN UP A NEW MARKET FOR SATURN 1B's

✓ B

March 30, 1964

Fw 3/30

B 3/31

NOTES 3-30-64 BELEW

*Fw H-1 ENGINE PROGRAM

H-1 engine R&D thrust chambers have been fabricated utilizing production components (stainless steel) and a new braze alloy. The braze alloy, Coast Metals 62, is significantly cheaper than the current production braze alloy of Permabraze. Also, a significant savings in furnace time is realized. It is estimated that a total savings of $15,000 per chamber can be expected. One unit successfully completed 3,000 seconds of engine testing at 200K. Another unit is in test now and has accumulated 505 seconds.

*Fw J-2 ENGINE PROGRAM

An R&D engine was gimballed for the first time this week. A 3-degree square pattern in four different modes was programmed. The program apparently was successful during the run, but post-test examination revealed damage to the load cells. (A detailed report will be forthcoming) The thrust chamber and injector test stand (VTS-1) were damaged on March 25, when an open-air detonation of bad fuel occurred. The solid propellant igniters used to burn off the bad fuel failed, and main chamber ignition caused detonation of the accumulated hydrogen. The test stand should be back in operation no later than March 30. Rocketdyne's proposal on a program to develop a 14 to 1 thrust chamber with detachable skirts is expected April 6. Design studies are currently under way relative to changes for deliverable skirts.

*Fw F-1 ENGINE PROGRAM

Government acceptance of the second F-1 engine to be delivered to MSFC is expected by March 27, and shipment will be made by Guppy on March 31, 1964.

The F-1 Engine Procurement Contract NAS8-5604 (approximately $158 million) contingent upon a number of corrections which involve obtaining the agreement of Rocketdyne was approved. Based on information available at this time, it is believed that Rocketdyne will be amenable to making a number of clause changes without recourse to reopening negotiations.

RL10 ENGINE PROGRAM

Pratt & Whitney studies on increasing RL10 performance by increasing chamber pressure while at the same time decreasing throat area of chamber (resulting in a 58 to 1 expansion ratio plus other changes to injectors for higher Isp) indicate an overall increase up to 10 seconds Isp. This may be of some interest if we think of a S-IB third stage and a cryogenic LEM loading stage.

Tw 3/30

B 3/31

NOTES 3-30-64 CLINE

1. S-IC STAGE GOX LINE SLIDING BRACKET: Studies and analyses by Assembly Engineering Section, Vehicle Systems Division, and Propulsion Division indicate that the GOX line bracket icing problem can be eliminated by inerting the area with gaseous nitrogen.

2. S-IC HYDRAULIC SUPPLY AND CHECKOUT UNIT: Due to problems associated with procurement of critical long-lead items, shipment of the first system has slipped to 4-27-64. Allowing for transporting from the West Coast, it should reach MSFC by 5-15-64.

3. SATURN V EQUIPMENT MANAGEMENT SYSTEM: Saturn V Vehicle Ground Support Equipment Office, Industrial Operations, has agreed to give our Ground Support Equipment Branch, Vehicle Systems Division, the full responsibility for technical coordination with, and direction of, The Boeing Company for that portion of the equipment management system which directly affects the Ground Support Equipment Branch.

4. S-IC STAGE F-1 ENGINE FLAMEUP: Investigation of the flameup on the F-1 Engine during startup and shutdown is continuing. The Boeing Company is planning to perform tests to determine the porosity of the engine curtains and the heat shield. The results of these tests will indicate the necessity for aft compartment vents and the duct size if vents are required. Studies completed to date indicate that the flameup will not have any adverse effects on the engine, components insulation, and heat shield.

Fred C. What exactly do you mean with the flameup? B

5. S-II and S-IVB INTERSTAGE VENTING: The S-II and S-IVB interstage venting system is designed to maintain an internal pressure greater than the local ambient during flight, thereby reducing the structural weights. Any leakage from the interstage is therefore critical. Efforts have been initiated to determine if a leak check of the interstage is necessary at Atlantic Missile Range to assure that the leakage is within acceptable limits.

6. SATURN I AND IB ATTITUDE CONTROL ENGINE: TAPCO fired the first production S-IVB attitude control engine for the Saturn IB pulsed duty cycle of 223 seconds. The only failure was the loss of pressure transducer midway through the test. This engine design is an intermediate step toward the final design to fulfill the Saturn V attitude control requirements.

7. SATURN V: S-IVB Auxiliary Propulsion System Module will be redesigned to implement the decision to utilize continuous cold gas venting during earth orbit and reduce the size of the system to provide an increase in payload.

Tue 3/30

NOTES 3/30/64 CONSTAN

B 3/31

Negative Report.

Fw 3/30

NOTES 3-30-64 DANNENBERG B 3/31

1. Saturn Brochures - Saturn IB performance data charts have been furnished Chrysler. This data was agreed to by both R-AERO and R-P&VE. A final draft copy of the brochure will be available for your review by 4-13-64.

The Saturn V Project Office has provided Boeing TAO funding to assemble the Saturn V brochure. The brochure format and performance data charts to be included have been reviewed and approved for the final draft. It is estimated that this brochure will be available for your review by 5-1-64.

Mr. McClard has been appointed to attend the monthly MOL meetings for coordination of Saturn Launch Vehicle information. Mr. Les Fero, MSF, has carried on this function in the past.

2. Configuration Control Management - NASA revision of AF Manual 375-1 is being circulated in R&DO laboratories for evaluation and assessment of possible impact. R&DO position will be available for IO review on 4-1-64. IO has coordination action with MSF.

3. Panel Review Board Secretariat met in Michoud and prepared PRB meeting at Huntsville, (4-16-64). (Mueller, General Phillips, Low, Piland will attend) Launch Operations Panel and Instrumentation and Communications Panel will give presentations.

4. Grissom (accompanied by Kuettner) visited Michoud as part of the "Awareness Program" and was highly impressed, specifically by Boeing's manufacturing methods.

5. The new (3rd) astronaut group (14 men) headed by Schirra will visit MSFC 5-7/8-64. A thorough briefing is being prepared.

Tw 3/30

NOTES 3/30/64 FORTUNE B 3/31

1. MTO Construction Worker Killed: Monday, about 10:15 p.m., a ready-mix concrete truck parked on Highway 43 was pouring concrete on a roadside project. An automobile side-swiped the concrete truck and killed the driver instantly. MTO personnel are working with State of Mississippi Highway Department to erect necessary signs in order to appraise the drivers of automobiles on the construction activity going on Highway 43. ✓

2. Dedication of Slidell Post Office on Saturday, March 28, by Deputy Post Master General Beden and Congressman Jimmy Morrison was attended by MTO Community Relations personnel, B. U. Jones, W. C. Mabry and myself. Both were very complimentary to NASA programs, Michoud, Slidell and MTO and encouraged local support. They also expressed gratification of our being there. Both were strong advocates of a pay raise for federal employees. Congressman Morrison was moderately optimistic about the bill passing if the time works out. ✓

Fw 3/30

NOTES 3/30/64 GEISSLER B 3/31

1. Saturn Guidance: The polynomial approach to Saturn guidance (adaptive guidance) has been drastically modified during the past three months. It has also been given a new name, "Minimax Guidance Mode," to conform to the principles upon which the modifications have been made, that is, minimum fuel for maximum perturbation. Three important changes have been made. These are: (a) reduction in the number of coefficients from 33 to 18 by selecting a polar coordinate system to replace cartesian coordinates for representation of the state variables, (b) explicit use of the partial derivatives of the thrust direction χ with respect to state variables r, V, θ, and F/m to guarantee tightness of the guidance loop, (c) selection of a small number (4) of low performance trajectories for the determination of the numerical coefficients in the guidance polynomial. These changes have resulted in a reduction of 95% of the effort required to calculate the Saturn guidance polynomial, a reduction of 50% of inflight computation effort, and increased the guidance accuracy by an order of magnitude. ✓✓

E.F. Sounds like a major break-through. Suggest you explore possibility of a cash award for one or a few of the men most directly involved. B See 1) (Forman)

2. SA-8 and SA-9 Elastic Body Data: The SA-8 and SA-9 bending frequency and mode shape theoretical data to which R-ASTR referred in item 2, Notes 3/9/64 Haeussermann (copy attached) was unofficially sent to R-ASTR on March 4. The official document, after concurrence by R-P&VE, was transmitted to R-ASTR March 11, 1964. ✓

3. Lewis Request for Support on Atlas - Agena: Representatives from Lewis and Lockheed visited us recently to request assistance on Atlas-Agena special wind criteria at AMR and PMR. During the visit, we reviewed a set of AMR directional wind criteria we developed earlier for ourselves when we had the Agena-Centaur program, which are still adequate. We offered (1) to review for Lewis any wind criteria that Lockheed may develop for them and (2) to prepare a special wind criteria document for their use. A significant additional workload on our part is not anticipated, since the basic data is available. It is gratifying to know that Lewis will still come to us at Marshall for help on technical problems. ✓

NOTES 3-30-64 GRAU B 3/31

1. S-I-7 POST-STATIC CHECKOUT: All automated test procedures for S-I-7 electrical post-static checkout have been completed and verified using the GETS. The vehicle moved into Station B, building 4708 for final electrical checkout on March 24, 1964.

2. S-IU-7 CHECKOUT: Instrumentation calibration is in process on the S-IU-7 Instrument Unit with 84 measurement calibrations completed to date.

3. S-IV-7 PRE-STATIC CHECKOUT: Pre-static Instrumentation Checkout of the S-IV-7 stage is in progress but is moving slowly due to modifications being performed concurrently.

4. SA-6 AND SA-7 DISTRIBUTORS: Regarding *NOTES dated 3-16-64 from Mr. Kuers and 3-23-64 from Dr. Gruene, major contributing factors to the discrepancies noted with the Power Distributors of SA-6 and SA-7 are as follows: (1) Inadequate design or design which causes modifications to be extremely difficult, (2) failure of the Manufacturing Engineering Laboratory to comply with MSFC-PROC-158B, (3) incomplete in-process inspection by the Quality and Reliability Assurance Laboratory. Corrective action required is the acceptance and compliance with all requirements of MSFC-PROC-158B by Manufacturing Engineering Laboratory and more complete evaluation by Quality and Reliability Assurance Laboratory. Additional manpower from Quality has already been assigned in this area. A more complete report will be furnished to the parties involved.

5. ROCKETDYNE QUALITY CONTROL SYSTEM: A letter was issued by Mr. H. L. Pontious, Space and Information Systems Division (S&ID) Quality Control Manager, stating that the Rocketdyne Quality Control System meets the S&ID requirements for control of the Engineering Development Valve Program. This letter was the result of a meeting among S&ID, Rocketdyne, NAA Corporate Office, NASA-O, Air Force at Rocketdyne, and MSFC Resident Manager's office personnel.

6. TRAINING OF AIR FORCE QUALITY CONTROL PERSONNEL: Plans have been formulated for training of Air Force Quality Control personnel in checkout operations at this Laboratory. These personnel will arrive today for a three-week training course which will cover essential aspects of vehicle checkout.

7. QUALITY PROGRAM SURVEY FOLLOW-UP: A follow-up was made to the recent quality program survey of the Eclipse-Pioneer Division, Bendix Corporation, Teterboro, New Jersey, (Contract NAS8-2539). The contractor has done considerable work to correct the deficiencies found on the previous survey. All the major deficiencies have been corrected, and the other remaining deficiencies are in the process of being corrected.

8. PERSONNEL TRANSFERS: In regard to Mr. Kuers *NOTES of 3-9-64, two GS-13 engineers and one Wage Board personnel have transferred without promotions from Manufacturing Engineering Laboratory to this Laboratory since June of last year. We are entirely satisfied with their contributions to the efforts of this Laboratory since their transfer. In the same period of time, this Laboratory has lost to Manufacturing Engineering Laboratory one GS-11 engineer, no promotion involved, one GS-13 engineer promoted to GS-14 and we are in the process of transferring another GS-14 engineer.

* Copies Attached.

Fw 3/30

NOTES 3-30-64 GRUENE B 3/31

SA-6 Status

1. Pre-launch preparations of Saturn SA-6 launch vehicle are proceeding satisfactorily according to the SA-6 Daily Work Schedule, Revision A, dated March 18, already distributed. Forthcoming milestone dates are:

Spacecraft erection	April 2
S-I RP-1 Tanking Test	April 6
Spacecraft launch vehicle electrical mate	April 20

2. Computer Controlled Telemeter Checkout, Complex 37. Machine language program for partial vehicle telemeter checkout at Complex 37 has been processed and is being debugged. It is planned to implement the checkout program on an experimental basis as time permits during SA-6 checkout schedule. ✓

3. The first automated overall systems test utilizing the RCA 110 will be performed April 3, 1964. ✓

NOTES 3/30/64 HAEUSSERMANN

B 3/21

1. STATUS REPORT - COMMUNICATION AND TRACKING WORKING GROUP:

Representatives of our Instrumentation and Communication Division attended a meeting at GSFC 3/12/64. This group is co-chaired by Messrs. Covington (GSFC) and Graves (MSC) and is responsible for resolving problem areas concerned with the Manned Space Flight Network. The main agenda item was the possibility of incompatibility between Launch Vehicle telemetry, command and tracking systems at distances of 4,000 to 14,000 nautical miles slant range with the presently existing and anticipated ground stations. A special group was formed consisting primarily of MSFC and GSFC personnel to investigate this matter in detail and report to the group at the next scheduled meeting.

The special group met 3/19 with the following conclusions reached.

a. The present VHF telemetry system is good to at least 4,000 nmi slant range. ✓

b. A parallel S-Band transmitter with a parallel input from the standard (72 kbit) telemetry system will work to the 14,000 nmi slant range. ✓

c. No problems exist in the command area. ✓

d. In the area of tracking, the exact status of the requirement is not clear. Two action items came out of this discussion.

(1) MSFC/GSFC will examine all the possible ways of providing this tracking coverage. ✓

(2) OMSF will determine the exact status of this requirement. ✓

NOTES 3/30/64 HEIMBURG

1. F-1 ENGINE TESTING (STATIC TEST TOWER WEST): A 70-second mainstage test (TWF-016) was conducted on 3/24. Malfunction of the facility (engine-mounted) hydraulic override valve allowed high pressure fuel to activate the four-way control valve override mechanism, causing the engine to shut down prior to intended duration (lox depletion). Cause of this malfunction is being analyzed. There was no facility damage; however, there was some minor engine damage as listed below:

a. The flexhose portion of the fuel pump balance cavity high pressure line ruptured during the test.

b. The gas generator hot gas bleed line failed at the flange-to-line weld.

c. One internal thrust chamber tube crack was found in tube 19.

Data from TWF-015 (conducted 3/20) and TWF-016 have shown an approximate 2% increase in engine performance over previous data. No explanation for this shift can be given at this time. The gas generator will be inspected for possible contamination of the fuel injector.

2. MTF WORKING GROUP: Negotiations with GE for the first increment of the MTF Phase II and III Technical Systems (Electronics, Instrumentation, and Materials Lab (EIM)) are now in progress. Contract award is anticipated by 5/1. Contract award by Mobile District Corps of Engineers for the brick and mortar portion of the EIM Lab is expected momentarily (low bidder: Fuller and Warrior, joint venture).

3. S-I-9 STAGE: The second static firing of S-I-9 (Test SA-19) was conducted on 3/24. Inboard engine cutoff was initiated by the flight sequencer 2 seconds after the lox low level sensor 3 was uncovered at 140.2 seconds after ignition command signal. Outboard engine cutoff was initiated by thrust O.K. dropout of engine 4 at 145.98 seconds after ignition command. The 3.78-second delay (nominal approximately 6 seconds) between inboard and outboard engine cutoff as experienced during this test was caused by the 20.5-inch orifice installed for static firing in the center lox tank manifold. Data evaluation to date indicates normal performance of all systems, and all engines were within their specified thrust limits. Post-test leak checks and data evaluation are continuing.

4. SATURN V GROUND SUPPORT EQUIPMENT (GSE) TEST FACILITY: Reference NOTES 3/23/64 HEIMBURG (copy attached). The problem of funding has apparently been resolved. It was decided to fund the entire American Machine and Foundry (AMF) contract with R&D funds. $1.28 million Saturn V GSE checkout funds are available, so this money will be utilized. The paper work to effect this funding action and to set a ceiling on the AMF contract is in the mill.

ATTACHMENT 1: NOTES 3/23/64 HEIMBURG (Attached to Dr. von Braun's copy only.)

Tues 3/30

B 3/31

NOTES 3-30-64 HOELZER

PURCHASE OF COMPUTERS BY ARMY: The Army has purchased their scientific computers consisting of one IBM 7094 and three IBM 1401 systems. The local people had nothing to say about this purchase. The whole thing was handled in Washington and the local people were simply informed that they now owned the computers sitting on their floor. Let us hope that NASA Headquarters does not behave in such an arbitrary manner. We can now purchase time on the local Army 7094 at $100 per hour as opposed to the $395 per hour we paid when their machine was leased.

FW 3/30

B 3/31

NOTES 3/30/64 JAMES

SATURN I/IB System Engineering - On March 25, a meeting was held with Dr. Mrazek, our Stage Managers and System Engineering Chief in which the major technical stage and vehicle problems were outlined. The discussions centered around the methods and procedures by which Stage Managers, Dr. Mrazek and Laboratories will function to jointly find solutions to our problems. A number of specific problems were discussed and preliminary approaches to the solutions were outlined. ✓

CCSD Mission Work Load - In an effort to expedite the contract coverage of tasks which qualify as mission effort, the following procedure is being followed: The Systems Engineering effort of approximately 180 people (primarily in P&VE) will be placed in the contract on a task assignment within the next few weeks. During the following three months, CCSD will define how these tasks will be converted to mission type efforts and prepare a proposal to MSFC. ✓ It is expected that about 85% of this systems engineering effort will qualify and be contracted as mission effort. Other arrangements for the balance will then be made. ✓✓

SATURN I - SA-6 - Checkout of the SA-6 vehicle at KSC is proceeding satisfactorily. ✓

SATURN IB - Saturn IB Design, Weight and Performance Review - This is a key meeting, scheduled for Thursday, April 2, tentatively at 9:00 A.M., on the above subject and your participation would be extremely beneficial. Will attend B

S-IVB Procurement Plan - Last week, this office concurred in the procurement plan for the eight follow-on S-IVB/IB Stages (SA-205 through 212). Discussions concerning incentive features have delayed this procurement plan. After considerable discussions with Contracts Office, it was agreed that this plan would be forwarded to Headquarters as a CPFF continuation. It is expected that this procurement plan will be forwarded to Headquarters early this week. MSFC will require authority by April 15 to let DAC accrue cost for pre-contract planning and long lead hardware. ✓

S-IB Stage Capacitance Type Propellant Loading Sensors - A modification has been placed in the CCSD contract to have CCSD obtain a suitable capacitance-type propellant loading sensing system for installation in the S-IB Stage. Because there is certain development effort required, the stage effectivity is not definite at this time. The current plan has provisions for installing both the delta-P system and the new capacitance-type probe system in the 105-inch LOX tank of the S-IB-D/F test vehicle and the first two S-IB stages. In S-IB-3 and subsequent, the desire is to have the capacitance-type probe, only, in both the Center LOX tank and the fuel #4 tank, however, there will be provision for either the new capacitance-type system or the delta-P system. The capacitance-type system will be introduced into the first S-IB Stage available after the system has been fully developed and accepted. ✓

RCA-110 Computer - Dr. Seaman's decision to negotiate only a fixed price contract with RCA for 19 additional Saturn IB and V computers will have definite impacts if totally applied. The manufacture of additional computers was hopefully to have dovetailed with fabrication of those under contract. However, RCA has predicted a 5 - 6 month break in fabrication due to definitizing a fixed price contract. If these predictions hold true, this could mean a 5 - 6 month delay in Complex 34 and 201 launch. Efforts are continuing to resolve this problem. Lee J. - Please keep me posted B

Fw 3/30

NOTES 3-30-64 Koelle B 2/31

1. NUCLEAR PULSE STUDY: We have apparently won our battle with OART to continue our study on the nuclear pulse concept. Two-hundred thousand dollars ($200,000) has been authorized and we should receive the money shortly. We have yet, however, to get NASA to establish a position on this subject and relay this to DOD. Our final draft of the MSFC position paper is on the way to you for signing. After printing we will send it, with a cover letter, through Dr. Mueller and Dr. Bisplinghoff to Dr. Seamans for action.

2. ORBITAL LABORATORY: The Langley Research Center has been preparing a design concept of a small orbital research laboratory to be launched on the SATURN V. Our contacts with them indicate that they are about finished, and are expected to contact us to obtain engineering support to determine the aerodynamic and structural effects upon the SATURN V vehicle. We have asked them to send the request for this supporting activity directly to you, with a possible telephone call from Dr. Thompson to explain their request. We have previously indicated that we would support their request, once it has been received. or their study?

3. ORBITAL LAUNCH OPERATIONS: This week we will have the final presentation on "Orbital Launch Operations," a study conducted by LTV, Dallas. It will be held in the auditorium from 9:00 - 12:00 on Thursday. You were exposed to an interim briefing late last year. Do you want a special briefing?

→ Occasionally, yes
B

NOTES 3-30-64 KUERS

B 3/31

1. Visitors from Purdue University, Indiana: Dr. Laskoe and Dr. Barash from the Manufacturing Engineering Laboratory of the School of Industrial Engineering of the above university visited us last week. Discussion on possible support by this University in manufacturing problem areas for Saturn V stages were discussed for two days. Their laboratories are apparently very well equipped for a great variety of manufacturing methods R&D task.

2. Proposal for NASA Facility for Large Stretch Formed Components: An analysis of presently used forming methods of gore segments for the S-II, S-IVB, and S-IC stages and a survey of existing equipment at the major aircraft companies has been conducted by the ME Working Group, resulting in a recommendation for a NASA stretch forming facility at the West Coast. A brief Internal Note on this subject has been prepared, a copy of which will be sent to you this week. This should be handled thru Dr. Mrazek, I.O. B

WK

3. Saturn V, S-ICT Stage:

a. The reliability of the new high speed welding technique in producing consistently good welds is not yet established to an extent that I would dare to use it for the close out weld for the Fuel Container. I have, therefore, decided to use again for this operation the slow welding method, used up-to-now, which requires hand repairs because of porosity in the weld.

b. The Y-ring has been welded to the dome of the lower Lox bulkhead. Weld quality is acceptable with a relatively small number of repairs required.

NOTES 3-30-64 MAUS B 2/31

1. MANPOWER PLANNING - As a result of an analysis of civil service manpower requirements, we have issued new civil service ceilings for FY64 thru FY66, assuming the MSFC total of 7,658 remains constant. These ceilings will enable the major elements to better plan their workforce, rather than continue to receive requests from their organizational elements which add to unrealistic totals. The all-inclusive ceilings are:

	FY64	FY65	FY66
R&DO	5021	4821	4816
IO	993	1193	1220
Staff	1644	1644	1622
	7658	7658	7658

We are now working toward establishment of corresponding ceilings for local contractor manpower levels. ✓

2. MANPOWER - UNFILLED SPACES - As of March 20, 1964, Marshall had 381 unfilled permanent spaces of which 75 were committed and 131 were filled with temporary employees. This represents a net gain for the week of 13 true permanent employees. Since Jan. 1, 1964, we have averaged an increase of only eight per week of this type employee. If this rate were continued through the remainder of fiscal year, 275 spaces would remain unfilled. By doubling the hiring rate, we would still have 150 permanent openings. These spaces could be filled by temporaries and permanent commitments, of course, but we actually need permanent employees during this period of peak workload.

Part of the slow recruiting is due to careful selection on the part of the organizations, since these are probably the last of MSFC's new spaces. Other spaces, however, are blocked by "space hoarding," administrative and personnel procedures, and delays in personnel processes. We are taking steps to clear these administrative blocks and expedite recruiting and personnel services where possible. ✓

3. CONGRESSIONAL MATTERS - Materials for Elliott Committee (select committee on R&D) including copies of hearing transcript, answers to questions raised by Mr. Elliott during the hearing, and photo coverage of the visit, were sent to NASA Legislative Liaison March 23, 1964.

We have notified Mr. Buddeke of NASA Legislative Liaison that you will be able to appear before the Pucinski Committee (Research Data Processing and Info Retrieval Center) on Apr. 28 at 9 a.m. Buddeke is to confirm this date by formal notification to us. Ray Kline is preparing your papers. ✓

The Thomas Subcommittee (House Appropriations) is scheduled to hear Center directors starting Apr. 7. Ray Kline is preparing backup materials. ✓

Tue 3/30

NOTES 3-30-64 McCartney B 3/31

1. FY-66 CONSTRUCTION OF FACILITIES BUDGET: All project writeups for the consolidated R&D Operations FY-66 CofF Budget Proposal have been completed and delivered to the Facilities and Design Office. ✓

MSC

2. REPAIR AND ALTERATIONS PROJECTS: Financial Management Office has certified $40,000 Administrative Operations Funds for P&VE's Ion Accelerator Facility. Fund allocation is still pending for the $2M of Repair and Alterations projects, which were previously R&D funded until the recent NASA Headquarters ruling that Administrative Operations Funds must be used for Repair and Alterations. ✓

What's that? → B

3. MANPOWER CONTROL: Last week, we met with six laboratories and offices to aid in categorizing contractor support for manpower control plans. The laboratories and offices are moving out strongly in developing these plans. Problems taken up during these meetings included conversion to one overall support contractor per laboratory, segregation of contractors, and provision of appropriate facilities. We plan additional meetings during April. On March 27, a representative of my Operations Engineering Group furnished guidance on manpower support categorization during the meeting on the GE Apollo contract amendment for Saturn IB/V electrical support equipment. ✓

4. STATUS OF SATURN "BLOCKED ACCOUNTS": As of March 26, unencumbered funds placed in blocked accounts for Saturn I remain about $8M and for Saturn IB about $6M. During the last two weeks, Saturn V "blocked" funds have been reduced from about $11-1/4M to $7.7M. ✓

NOTES 3/30/64 RUDOLPH

1. Meeting with General Phillips - General Phillips, Mr. Calopy (MSF-Configuration Management) and Mr. Thompson (Bellcomm) were at MSFC on March 26, 1964 and the following subjects were discussed: (1) Saturn IB and Saturn V - Vehicle to Vehicle differences, (2) S-IVB (V/IB) differences, (3) IU (V/IB) differences, (4) configuration Management, (5) AZUSA requirement for launch vehicle development (need for AZUSA station on Bahama). The meeting was for information exchange and no specific actions resulted.

2. Low Bay - Plans have been finalized for elimination of the low bay pre-mate stage checkout in the VAB.

3. S-IC Stage:

Technical Direction Meeting - The first monthly Technical Direction Meeting with The Boeing Company was held on March 24, 1964. Indications are that this meeting will be most beneficial in resolving problem areas concerning the S-IC Stage.

S-IC-T Status - Fuel Tank delay remains at five weeks. Both upper and lower bulkhead assemblies are in the VAB for fit-up and mating plus installation of internal hardware. LOX Tank - The lower bulkhead is back on the bulkhead assembly fixture for Y-ring attachment after having successful polar cap installation. Thrust Structure delay is now reported as four weeks, an increase of one week to the S-IC-T structure. Seven skin segments have been received and are defective. Currently two of these skins have been installed experimentally, with vertical strings and other hardware being shifted about to favor the pre-drilled mounting holes.

4. S-II/S-IVB Common LH_2 Propellant Conditioning System - Was discussed in a meeting at MSFC with representatives from NAA/S&ID and Douglas on March 24, 1964. It was decided to standardize on the recirculation pump and motor and snap type electrical connector. Appropriate contractual action is being taken to implement these decisions. The standardization of other systems and components was prevented by design considerations, cost impact, and schedule impact.

5. S-IVB Formal Qualification Program - The Douglas Formal Qualification Program has been reviewed by MSFC representatives and a final response has been given to Douglas outlining the extent of the approved program. The original scope change received from Douglas included a list of 105 critical items to be tested. This was later revised to include a total of 124 items. The list of components as now approved and coordinated with Douglas contains 79 items.

6. IBM Procurement Plan Amendment - Comments by NASA Headquarters on the Procurement Plan Amendment for IBM additional effort were received March 25, 1964. Comments have been incorporated and the Procurement Plan was handcarried to Washington on March 30, 1964.

7. "Follow-on" buy of RCA Computer equipment - P&C has advised that Dr. Seamans decided there will not be a letter contract for the "follow-on" buy of RCA Computer equipment. A quick look indicates a minimum of 6 to 7 months slip in the J1 schedule based on the S-IC stage checkout delay.

→ AR
Let me know when you feel we must ring the alarm bell
B

Fw 3/30

B 3/31

NOTES-3-30-64-SHEPHERD

S-IVB Facilities - Sacramento: The present plan for the Sacramento facilities is for the construction of two test stands, Instrumentation and Control Center and supporting facilities. The Beta I stand will be used for battleship and acceptance testing of stages for the Saturn IB and Beta III will be used for the all-systems and acceptance testing of stages for the Saturn V. Design began in September 1962 and construction has proceeded on an incremental basis. Beta I test stand was accepted by Douglas in March 1964 (16 months after start of design) and is scheduled for battleship cold flow test in April. Beta III test stand is scheduled for beneficial occupancy by Douglas in June (19 months after design start). The Gamma Complex (attitude control motor test site) is the only facility which appears to be behind the R&D need date. This facility is approximately one month late. No major program impact is expected. The design of these facilities was accomplished by the Ralph M. Parsons Company under contract with the Los Angeles District Engineer and the construction has been performed under the supervision of the Sacramento District Engineer. Both of these activities have been closely monitored and directed by Marshall. ✓

* Fw General Accounting Office (GAO) I-10: The GAO has submitted a draft of their final report to Congress in regard to their findings on the Interstate Highway 10 Bascule Bridge at the Pearl River crossing. The present plans are to build a high-level 73 foot vertical clearance bascule bridge at the river crossing to permit uninterrupted traffic on the Interstate Highway. This high-level bridge requirement increases the total Government cost for providing a river crossing by approximately $4.5M. The GAO, in their draft report, recommends to Congress that a low-level bascule bridge be built and that the I-10 Highway traffic be interrupted for each shipment to the Mississippi Test Facility. The high-level bridge requirement was imposed on Marshall by the Bureau of Public Roads, therefore, the defense of this bridge is up to the Bureau of Public Roads. Our first position was for a low-level bascule bridge, which would require opening upon passage of any bardge traffic to the Mississippi Test Facility. Marshall is budgeted for $4.5M for the high-level bridge. ✓

Tu 3/30

B 3/31

NOTES 3-30-63 Stuhlinger

1. SRT PROGRAM STATUS: The status of the portion of the SRT program managed by RPL as of March 30 is as follows:

	ANNUAL PLAN	AUTHORIZED	PROCESSED TO FMO	OBLIGATED
OART	10,249,000	10,249,000	8,010,000	1,870,000
OMSF	14,163,000	14,133,000	9,560,490	182,000
OSSA	675,000	675,000	637,075	17,265
	25,087,000	25,057,000	18,207,565	2,069,265

An additional $90,000 has been received from OART (Space Vehicle Systems), and the FPO Aeronautics Program for $250,000 was withdrawn. After these modifications, the total OART SRT program under the cognizance of RPL changed from $10,409,000 to $10,249,000.

While the present processing rate for procurement actions from RPL to FMO is sufficient to meet the deadline of April 15, the present rate of obligating task funds in P&C is only one-fifth of the rate necessary to make the deadline of July 1 for obligations. Mr. Buckner assured us that he will be able to increase the rate sufficiently to meet that deadline. ✓

2. FY-65 SRT PROGRAM: Parallel to their effort to process and negotiate the FY-64 SRT program, the Laboratories and RPL are presently preparing the FY-65 SRT program. Most of the Laboratories submitted their task list last week; the rest will be submitted this week. Besides the usual RPL functions of screening the task sheet for technical accuracy and non-duplication, of discussing with other Laboratories the cases of multi-laboratory interest, and of reducing the submitted program to the Headquarters guidelines (approximately $25 million) by consideration of Laboratory and Center priorities, there will be the additional requirement this year to coordinate the R&DO-SRT Program with an IO-SRT Program of $41 million, to be handled by the Saturn Office.

Executive Staff and Resources Management Office requested RPL to submit the FY-65 SRT program with detailed task descriptions by April 1. Obviously, this will not be possible. RPL will submit by April 1 the FY-65 SRT program broken down to the Sub-Program level for immediate transmittal to Headquarters. About 15 work days will be required at RPL to establish a well coordinated and well screened program with task-level details. We asked Executive Staff to request from Headquarters postponement of the task-level submission date until the end of April. Your support of this request is solicited. ACTION REQUIRED

Hans Mauss

Status? Please notify RPL direct

B